Preliminary Draft

Environmental Assessment/Regulatory Impact Review

for a Fishery Management Plan Amendment

to Establish a New Program for Observer Procurement and Deployment in the North Pacific

May 6, 2005

North Pacific Fishery Management Council
Anchorage, Alaska

National Marine Fisheries Service
Alaska Regional Office
Juneau, Alaska

Alaska Fisheries Science Center
Seattle, Washington

Executive Summary

This draft Environmental Assessment/Regulatory Impact Review (EA/RIR) examines the environmental and economic effects of an FMP amendment to restructure the North Pacific Groundfish Observer Program (Observer Program). The proposed action is intended to address a variety of longstanding issues associated with the existing system of observer procurement and deployment. At its February 2003 meeting, the Council approved the following problem statement for restructuring the Observer Program:

Observer Program Restructuring Problem Statement

> *The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives.*

Since earlier attempts to restructure the program had not been successful, NMFS, Council staff, and the OAC began to consider a stepwise approach. This was based on the concept that it might be effective to undertake a less ambitious restructuring effort focused primarily on those regions and fisheries where the problems of cost-equity and coverage are most acute. The intent was that once a restructured program had been implemented successfully for some fisheries, the Council could decide whether or not to proceed with expanding the program to include additional fisheries. The initial alternatives approved by the Council in April 2003 reflected this approach, and focused primarily on the groundfish and halibut fisheries of the GOA, with options to include BSAI groundfish vessels that currently have less than 100% coverage requirements. In December 2003, the Council reviewed a preliminary draft analysis of the impact of those alternatives that were focused primarily on the GOA.

As NMFS began to evaluate alternatives under this scenario, however, concerns arose that certain operational and data quality issues would be difficult to resolve under a "hybrid" system and that, in fact, some of these problems would likely become exacerbated under such a system. NMFS identified a range of operational and data quality issues associated with the current model. These included the agency's inability to: determine where and when observer coverage takes place on less-than-100% observed sectors of the fleet; match observer skill level with deployment complexity; reduce observer coverage for sectors of the fleet that are now subject to 100% or greater coverage levels; and implement technological innovations which might meet monitoring needs while reducing observer coverage costs and expenses.

At the February 2004 Council meeting, NMFS described the above concerns and informed the Council that the agency had determined that effective procedures for addressing observer performance and data quality issues could only be addressed through a service delivery model that provided direct contractual arrangements between NMFS and the observer providers. NMFS thus recommended that the Council include an additional alternative to the draft analysis that would apply the proposed direct contract model program-wide, so that all observer services in both the BSAI and the GOA would be provided by observer companies through direct contracts with NMFS.

At its June 2004 meeting, the Council approved the suite of seven alternatives contained within this analysis (which includes the comprehensive alternative recommended by NMFS) as well as options for two types of fees: 1) an ex-vessel value fee and 2) a daily observer coverage fee. All of the action alternatives would replace the current pay-as-you-go system (in which vessels contract directly with observer providers to meet coverage levels specified in regulation) with a new program, supported by broad-based user fees and/or direct Federal subsidies, in which NMFS would contract directly for observer coverage and would be responsible for determining when and where observers should be deployed. Under this proposed program, vessel operators in fisheries with less than 100% coverage would no longer be responsible for obtaining certain levels of observer coverage specified in regulation, but instead, will be required to carry observers when requested to do so by NMFS. Vessels and processors in fisheries that require 100% or 200% coverage will continue to operate much the same as they do today, except that NMFS will be responsible for observer procurement rather than the fishing companies themselves.

Summary of the Alternatives

The six action alternatives are distinguished primarily by which fisheries would be included in the new program, and are organized in ascending order from the smallest to the largest in terms of scope. Each alternative represents a comprehensive program constructed from the **following five program elements**:

- **Scope**: Which vessels and processors would be included in the program?
- **Coverage requirements:** What levels of coverage would be required for each vessel, processor, or fishery category?
- **Funding mechanism:** How would the costs of observer coverage be funded?
- **Technological/equipment requirements:** What types of equipment and technologies would vessels be required to deploy in order to facilitate coverage by observers?
- **Contracting process:** How would NMFS contract with observer providers to obtain observer coverage?

The alternatives under consideration are as follows:

Alternative 1. ***No action alternative***. Under this alternative, the current interim "pay-as-you-go" program would continue to be the only system under which groundfish observers would be provided in the groundfish fisheries of the BSAI and GOA. Regulations authorizing the current program expire at the end of 2007, meaning that no action is not a viable alternative over the long-term. For this reason, NMFS recommends the addition of an option to extend indefinitely the existing program for all fisheries not covered by the preferred alternative. See Option 8 below.

Alternative 2. ***GOA groundfish vessels only.*** Under this alternative, a new fee-based program would be established for GOA groundfish vessels, including GOA groundfish vessels <60'. Regulations that divide the fleet into 0%, 30%, and 100% coverage categories would no longer apply to vessels in the program, and vessel operators would no longer be responsible for obtaining their own observer coverage. Under the new program, NMFS would determine when and where to deploy observers based on data collection and monitoring needs and would contract directly for observers using fee proceeds and/or direct Federal funding. The fee would be based on a percentage of the ex-vessel value of each vessel's GOA groundfish landings and would be collected through annual billing by NMFS.

Alternative 3. ***GOA groundfish vessels and halibut vessels only.*** This expands on Alternative 2 by including halibut vessels from all areas off Alaska. Fees would be collected from halibut landings as well as groundfish landings through annual billing by NMFS, and NMFS would have the authority to place observers on halibut vessels as well as groundfish vessels.

Alternative 4. ***GOA groundfish vessels, halibut vessels and GOA-based groundfish processors.*** This alternative expands on Alternative 3 by including GOA-based groundfish processors. However, in contrast to Alternatives 2 and 3, fees would be collected by processors at the time of landing, and fee proceeds would be submitted to NMFS on a quarterly basis.

Alternative 5. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, BSAI fixed gear catcher vessels (CVs), jig vessels, and BSAI pot vessels.*** This alternative expands on Alternative 4 by including BSAI fixed gear CVs (longline and pot), jig vessels, and BSAI pot catcher processors (CPs).

Alternative 6. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, all BSAI groundfish vessels <125', and all BSAI pot vessels.*** This alternative expands on Alternative 5 by adding BSAI trawl CVs under 125', and BSAI trawl and longline CPs <125'. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

Option 1: **Include longline CPs ≥125'**. This suboption would expand Alternative 6 by including longline CPs ≥125' operating in the BSAI.

Option 2: **Include non-AFA trawl CPs ≥125'**. This suboption would expand Alternative 6 by including non-AFA trawl CPs ≥125'.

Option 3: **Include BSAI trawl CVs ≥125'**. (Staff recommends inclusion of this option). Adding this option would allow all CVs operating in the BSAI to be covered under a single uniform program. Without this option, the predominantly AFA CV fleet (<125' and ≥125') operating in the BSAI would be split between two separate observer programs despite the fact that the two classes of vessels would in many cases be fishing side-by-side and delivering to the same processors.

Alternative 7. ***Comprehensive alternative: All groundfish vessels and processors and all halibut vessels.*** This alternative would establish a new fee-based Observer Program in which NMFS has a direct contract with observer providers for all GOA and BSAI groundfish

and halibut vessels in the Federal fisheries. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

In developing the alternatives, the Council also included several options that may be applied to more than one alternative:

Option 4: **Exclude GOA-based inshore processors**. (Alternatives 5 and 6). This option would exclude GOA-based inshore processors from the program under Alternatives 5 and 6. The effect of the alternative would be to establish a vessel-only program for the covered fisheries in the GOA and BSAI.

Option 5: **Establish an opt-in, opt-out provision for BSAI-based inshore processors**. (Alternatives 4 through 6). This option applies only if Option 4 is rejected. This option would allow each BSAI-based processor to determine for itself whether to opt-in or opt-out of the program. Processors opting into the program would pay observer fees on all groundfish and halibut landings they receive and would receive their observer coverage through the program. Processors electing to opt-out would pay observer fees on only those landings received from vessels that are participating in the program and would pay no fees on landings from vessels that are not participating in the program.

Option 6: **Include CDQ fishing for participating vessels** (Alternatives 5 and 6). Under this option, vessels that participate in the program when fishing in non-CDQ fisheries would continue to be included in the program when fishing CDQ. This option would allow vessel operators to obtain their coverage through a single program throughout the fishing year and would allow them to switch back and forth between CDQ and non-CDQ fisheries without changing observers. Without this option, vessel operators could be forced to switch observers and observer providers when switching between CDQ and non-CDQ fishing and would be obligated to pay two separate types of fees depending upon whether the vessel is fishing CDQ or non-CDQ.

An additional option applies to the type of fee program selected.

Option 7: **Uniform fee program.** (Alternatives 6 and 7) Under this option, a uniform ex-vessel value fee would be required for all vessels and processors covered by the program in place of the two separate fee programs that are contained in Alternatives 6 and 7. Adoption of this option in conjunction with Alternative 7 would establish a program similar to the Research Plan that was implemented in 1994 and repealed in 1995.

Finally, NMFS recommends inclusion of an option to address the expiration of the existing program for fisheries not covered under the preferred alternative.

Option 8: **Remove 2007 expiration date for no-action fisheries.** Under this option, the December 31, 2007 expiration date for the current program would be removed. This means that under Alternatives 2 through 6, the Council's preferred alternative would establish two permanent programs: (1) a new program for those vessels or fisheries covered by the action alternative, and (2) the permanent extension of the existing program for fisheries not covered by the action alternative.

Major decision points

In developing a preferred alternative, the Council is faced with a series of decision points which are summarized below.

Decision Point 1: Scope. Which vessels and processors would be included in the new program?

This decision point addresses which vessel and processor classes would be included in the new program. Table ES-1 provides a summary of the vessels and processors included under each alternative.

Table ES-1 Vessels and processors included under each of the action alternatives

Vessel/Processor class	*Alt. 2*	*Alt.3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
GOA groundfish vessels	Yes	Yes	Yes	Yes	Yes	Yes
Halibut vessels (all areas)		Yes	Yes	Yes	Yes	Yes
GOA-based inshore processors			Yes	Yes (with Option to exclude)		Yes
BSAI fixed gear CVs				Yes	Yes	Yes
BSAI pot vessels				Yes	Yes	Yes
BSA-based I inshore processors			Each processor may elect to opt-in or opt-out			Yes
BSAI trawl CVs <125'				Yes	Yes	Yes
BSAI trawl CV ≥125'					Option to include	Yes
BSAI longline CPs <125'					Yes	Yes
BSAI trawl CPs <125'					Yes	Yes
BSAI longline CPs ≥125'					Option to include	Yes
BSAI non-AFA trawl CPs ≥125'					Option to include	Yes
AFA inshore processors			Each processor may elect to opt-in or opt-out			Yes
AFA motherships						Yes
AFA CPs						Yes
CDQ vessels and processors				Option to include vessels and processors that are included in the program for their non-CDQ activity		Yes

Decision Point 2: Coverage requirements. How would coverage be assigned to each class of vessel and processor?

The issue of coverage levels arises with the implementation of a program that rescinds the current coverage levels based on vessel length and processing volume and replaces them with one in which NMFS has more flexibility to decide when and where to deploy observers. However, some type of organizational structure is still necessary to categorize vessels and processors for the purpose of determining coverage levels. As a replacement for the existing vessel-length based categories, the following four tier system of coverage is proposed. Vessels and processors would be placed into one of the four coverage tiers based on their fishery and operating mode. The purpose of designing this four tier coverage system is to establish clear and uniform criteria for determining what level of coverage is required in each fishery. **The determination of which fishery sectors are placed into which tier is a decision point at final action.**

The establishment of uniform criteria for determining coverage requirements will also assist the Council in determining what levels of coverage are necessary when new management programs are proposed. Note that placement of a particular fishery or vessel class into a particular coverage tier may, or may not, affect the type or amount of fee that would be assessed. As provided in more detail in Section 2.4, the Council has the option of establishing a uniform ex-vessel value fee that applies to all fisheries within the program, or to establish separate fee programs (an ex-vessel based fee and a daily observer fee) for fisheries in the different coverage tiers.

The following is a description of the four proposed coverage tiers:

- **Tier 1 fisheries (200% coverage).** These are fisheries in which two observers must be present so that observers are available to sample every haul on processors or delivery on vessels. Tier 1 fisheries are generally those in which observers are directly involved in the accounting of individual vessel catch or bycatch quotas.

- **Tier 2 fisheries (100% coverage).** These are fisheries in which one observer is deployed on each vessel and processor. In contrast to Tier 1, it is recognized that the observer will likely be unable to sample all hauls or deliveries due to workload constraints and will, therefore, follow random sampling procedures so that the vessel or processor will not know in advance which hauls or deliveries will be sampled. Under certain circumstances, vessels that would otherwise qualify for Tier 1 coverage could operate with a single observer in Tier 2 if they are operating under restricted hours, or under an alternative monitoring plan approved by NMFS in which alternate technologies are used to monitor scales when the observer is absent.

- **Tier 3 fisheries (regular coverage generally less than 100%).** *(This tier replaces the old 30% coverage requirement).* These are fisheries in which NMFS is dependent on observer coverage for inseason management but in which 100% coverage on every vessel is unnecessary because observer data is aggregated across a larger fleet. Vessels participating in Tier 3 fisheries can expect to receive coverage on a regular basis and will be required to carry observers when requested to do so by NMFS. However, the actual coverage that each vessel receives will depend on the coverage priorities established by NMFS and the sampling plan developed for the individual fishery in which the vessel is participating. The actual coverage a particular vessel or processor receives could range from zero to 100%, but on a fleet-wide basis, coverage levels are more likely to average closer to 30%.

- **Tier 4 fisheries (infrequent coverage).** These are fisheries in which NMFS is not dependent on observer data for inseason management. Coverage levels in Tier 4 fisheries are expected to be

low and infrequent and used for special data needs and research rather than inseason management. Halibut vessels, jig vessels, and groundfish vessels <60' are likely to fall into Tier 4. In these fisheries, NMFS could deploy observers on vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data. Vessels participating in Tier 4 fisheries would be required to carry observers when requested to do so by NMFS but such requests are unlikely to occur on a regular basis.

Under this four tier structure, the coverage levels would remain unchanged from the status quo for most vessels and processors that currently have 100% or 200% coverage requirements. The biggest change would occur for vessels that currently have 30% coverage requirements or no coverage requirements. Under the four tier structure, most current 30% vessels would fall into Tier 3 and can expect regular coverage at a level less than 100%. Most vessels that currently have no coverage requirements will fall into Tier 4 and will be required to carry an observer when requested, but can expect such coverage to be a relatively rare occurrence.

This analysis does not propose an annual mechanism through which a fishery would change from one tier to the next if it is determined that coverage levels need to be increased or decreased. Currently, all coverage levels are established in regulation and any changes to existing coverage requirements must be implemented through notice and comment rulemaking. The Council and NMFS may wish to consider whether a more flexible, frameworking process is warranted or possible, and legal guidance has been requested from NOAA GC on this issue (December 29, 2004). However, this analysis assumes that formal rulemaking would be necessary to change fisheries from one tier to another under the new system. Flexibility would still be substantially increased through the proposed system, however, as the coverage levels for fisheries within Tiers 3 and 4 could be shifted and modified on an inseason basis. Table ES-2 provides a summary of the proposed tier classifications for each class of vessel and processor.

Table ES-2 Proposed tier classifications for vessels and processors

Vessel/processor/fishery	*Current coverage requirement and future coverage requirements proposed under other programs*	*Proposed tier classification*
AFA CPs	200% coverage	Tier1
CDQ CPs	200% coverage	Tier 1
AFA motherships	200% coverage	Tier 1
AFA inshore processors	1 observer for each 12 hour period (i.e. 2 observers if plant operates more than 12 hours/day)	Tier 1
non-AFA trawl H&G vessels ≥125' in the BSAI	100% coverage currently. 200% coverage under Amendment 79 groundfish retention standard (GRS)	Tier 2
CPs fishing for Atka mackerel in the Aleutian Islands Subarea	200% coverage	Tier 1
non-AFA Trawl H&G vessels <125' in the BSAI	30% coverage currently. However, 200% coverage would be required under proposed BSAI Amendment 80 if these vessels joined fishery cooperatives.	Tier 2
non-AFA Trawl H&G vessels ≥125' in the GOA	100% coverage	Tier 2
CVs >60' and pot CPs fishing CDQ	100% coverage	Tier 2
non-AFA Trawl H&G vessels <125' in the GOA	30% coverage	Tier 2
non-AFA inshore processors	0%, 30%, or 100% based on processing volume	Tier 3
Trawl CVs ≥125' (Including CDQ and AFA)	100% coverage	Tier 2 or Tier 3 with possible video monitoring requirement.
Trawl CVs 60'-125' (Including CDQ and AFA)	30% coverage	Tier 3
Longline CPs ≥125'	100% coverage	Tier 2
Longline CPs 60'-125'	30% coverage	Tier 2
Longline CVs 60'-125'	30% coverage	Tier 3
Longline CVs ≥125'	100% coverage	Tier 3
Pot vessels ≥60'	30% coverage	Tier 3
Halibut vessels	no coverage	Tier 4
Jig vessels (all sizes)	no coverage or 30% depending on vessel length	Tier 4
Groundfish vessels <60'	no coverage	Tier 4

Decision Point 3: Funding mechanism. Type of user fee and the initial fee percentage

All of the alternatives contained within this analysis anticipate funding the new observer program through some combination of user fees and direct Federal funding Federal funding may be necessary to get the program up and running, cover some direct coverage costs if industry fees are inadequate, and cover agency costs associated with implementing and maintaining the program (see above). Therefore, any decisions related to the type of user fee would not preclude the possibility of obtaining Federal funding to cover observer deployment costs. There are several decisions related to the funding mechanism under each alternative. Section 2.4 outlines the primary issues and concepts relevant to the funding mechanism:

- Types of fee (ex-vessel value or daily observer fee)
- Uniform or variable fees
- Supplemental fee options for special programs
- Initial fee percentage
- Process for adjusting fee percentages
- Fee collection mechanism
- Start-up funding and Federal funds
- Restriction on the use of fee proceeds

Two primary types of fee programs are proposed: 1) an ex-vessel value based fee and 2) a daily observer coverage fee. Fees based on the ex-vessel value of landed catch are the most common type of fee currently used in the North Pacific. The most viable alternative to a fee based on ex-vessel value is a daily coverage or observer fee based on coverage costs. This approach would to some extent mirror the existing "pay-as-you-go" program, except that vessel owners would be billed by NMFS for their coverage instead of contracting directly with an observer provider. This approach is likely only feasible for vessels and processors with 100% or greater coverage. Such a fee could be designed to exactly match the direct costs of observer coverage, as is currently the case with the existing pay-as-you-go program, or the fee could be set at a lower level than actual coverage costs if Federal funds are available to support the program.

Regardless of the alternative chosen, setting an initial fee percentage is an important decision for the Council for any alternatives that use an ex-vessel value fee. The fee percentage (and the level of Federal funding) would determine the program's budget and would directly affect coverage levels in the fisheries covered by the program and costs paid by industry. The issue of how much coverage is necessary or optimal to manage particular groundfish and halibut fisheries is complex and goes beyond the scope of this analysis. The process proposed to determine coverage levels in the fisheries that will have less than 100% coverage requirements (Tier 3 and 4) is described in the RIR.

Most of the fisheries in question are currently evolving, as a rationalization program is under development for the GOA groundfish fishery and various bycatch management cooperative proposals are under development for the BSAI groundfish fisheries, and future coverage needs are unknown. It is also beyond the scope of this analysis to determine what levels of coverage would ultimately be necessary to implement the various rationalization and bycatch management proposals that are currently under development. **For this reason, this analysis is limited to considering the fee percentages necessary to maintain existing levels of coverage overall (with the flexibility to shift coverage among the Tier 3 and 4 fisheries as necessary) and provide some resources to expand the program into fisheries that currently have no coverage (the halibut and <60' groundfish fleets) in the absence of any direct Federal funding.** To the extent that Federal funding becomes available, fee percentages could be

reduced or coverage increased. Therefore, three fee levels (upper, middle, and lower endpoints) are proposed for Council consideration under each alternative in the RIR.

Option 1: Maintain the existing number of deployment days (lower endpoint). Under this option, the fee percentage would be set at the level necessary to provide an equivalent number of coverage days that are currently provided under the status quo. NMFS would have roughly the same number of observers to work with as are available under the status quo, but would have the flexibility to deploy these observers in a more rational fashion to maximize the utility of the data collected. Under this option, any deployment of observers in the halibut fishery and on groundfish vessels <60' would come at the expense of existing coverage levels on shoreside processors and groundfish vessels ≥60'. Under all of the alternatives, the average costs of observer coverage for vessels that currently carry observers would go down under this endpoint because the status quo number of coverage days would be supported by revenues from a wider fleet than under the status quo.

Option 2: Establish a fee percentage that accommodates 100% coverage for trawl and longline CPs <125' while maintaining the existing number of observer days for the remaining fleets covered by the program (mid-point). Under this option, all trawl and longline CPs <125' would be assigned to Tier 2, and fees would be increased relative to Option 1 to accommodate this increase in coverage without affecting coverage levels in other fisheries.

Option 3: Establish a fee percentage that is self-supporting at current coverage levels for sectors that currently have coverage and apply the same fee percentage to all new fisheries into which the program expands (upper endpoint). Under this option, the fee percentage would be set at a level necessary for fee revenues from the currently covered sectors of the industry (groundfish vessels ≥60' and shoreside processors) to fund the current number of deployment days in those sectors. Each new sector that is not currently covered that comes into the program will generate additional fee revenues so that expansion of coverage into the <60' groundfish and halibut fleets would not necessarily come at the expense of existing coverage for vessels ≥60'. Because the average daily revenues generated by halibut vessels and groundfish vessels under 60' are lower than the average daily revenues generated by groundfish vessels ≥60', and because observer costs per deployment day are generally higher for small vessels that operate out of more remote ports, fee revenues generated by halibut vessels and groundfish vessels under 60' would not be adequate to extend coverage to those vessels at levels currently in effect for groundfish vessels ≥60'. A precise estimate of the level of coverage that the upper endpoint fee would provide for halibut and groundfish vessels <60' will be difficult to make because data on the average number of fishing days for such vessels is unavailable.

Table ES-3 provides estimates of the low, mid, and high fee endpoints for each alternative. These estimated are based on current estimates of daily coverage costs. Estimated fee percentages range from 0.48% for the Alternative 3 low endpoint fee percentage to 1.86% for Alternative 6 (all options) high endpoint fee percentage. The fee percentages vary substantially from alternative to alternative because as each group of vessels is included in the program, they bring with them both a revenue base, in terms of the ex-vessel value of their landings, and coverage needs. However, the coverage needs relative to revenue base for each group of vessels varies substantially.

Table ES-3 Estimated observer days, coverage cost, and fee percentages for low, mid, and high endpoint fee options based on 2000-2003 average coverage days and ex-vessel revenues

Alternative	Observer days			Observer cost			Estimated fee %		
	Low	Mid	High	Low	Mid	High	Low	Mid	High
Alt. 2	3,809	5,711	5,937	$1.35	$2.03	$2.11	**0.94%**	**1.41%**	**1.47%**
Alt. 3	3,809	5,711	11,714	$1.35	$2.03	$4.16	**0.48%**	**0.72%**	**1.47%**
Alt. 4	5,584	7,485	11,213	$1.98	$2.66	$3.98	**0.52%**	**0.70%**	**1.05%**
Alt. 5	9,481	11,382	15,803	$3.37	$4.04	$5.61	**0.69%**	**0.83%**	**1.15%**
Alt 6	11,611	18,483	18,810	$4.12	$6.56	$6.68	**0.81%**	**1.28%**	**1.31%**
Alt 6-option 1	18,485	25,357	28,239	$6.56	$9.00	$10.02	**1.16%**	**1.59%**	**1.77%**
Alt 6-option 2	15,647	22,519	23,953	$5.55	$7.99	$8.50	**0.99%**	**1.42%**	**1.51%**
Alt 6-option 3	15,587	22,459	23,257	$5.53	$7.97	$8.26	**0.93%**	**1.34%**	**1.39%**
Alt 6-all options	26,497	33,369	36,745	$9.41	$11.85	$13.04	**1.34%**	**1.69%**	**1.86%**
Alt 7-tiers 3,4 only	9,481	11,382	15,803	$3.37	$4.04	$5.61	**0.69%**	**0.83%**	**1.15%**
Alt 7-all tiers	36,585	43,457	45,301	$12.99	$15.43	$16.08	**1.28%**	**1.52%**	**1.58%**

Finally, there are two major issues discussed in the analysis for which the Council is not being asked to make decisions at this time: 1) technological requirements and 2) the contracting process.

Technological requirements: Electronic fishing logs, electronic reporting requirements, and VMS.

The analysis contains extensive discussions of a variety of technological requirements that will facilitate implementation of a restructured observer program. These include:

- **Electronic fishing logbooks** so observed and unobserved vessels can report fishing activity electronically from the fishing grounds.
- **Revised electronic reporting requirements** for processors that will facilitate the collection of ex-vessel fees.
- **VMS requirements** to enable NMFS to monitor and enforce compliance with check-in/check-out requirements.

While the above technological requirements may represent decision points for the Council at a future date, they are not currently presented as decision points for the Council in this analysis. This is primarily because all three types of technological requirements are part of larger program initiatives that will be developed on separate tracks. Therefore, this analysis does not propose making decisions related to these issues at this time.

Contracting process

Under all of the alternatives under consideration, private contractors would continue to be the source of observers deployed under the restructured program. The main difference from the status quo is that NMFS would be the entity responsible for contracting for observer coverage rather than the vessel owner. Complicated regulations and procedures already govern the Federal contracting process. Therefore, this

analysis does not examine alternatives to the process that would govern direct Federal contracting for observer services. The existing Federal contracting process is described in Section 4.8 to provide the Council and the public with an understanding of how the program would operate, should one of the action alternatives be adopted. This section also explores the role of contractors under a new program, and whether single or multiple contracts, and single or multiple contractors, are preferable.

Several different contract modules are possible but are difficult to develop until the scope of work is defined. In essence, there are several ways to accomplish any task and distribute work. Contracting is flexible and will accommodate various desired scenarios. For example, the work can be broken into components regionally (BSAI or GOA), by gear type, or by vessel size class. Various combinations are possible. It is also possible to develop different types of work modules. One module could be for overall coverage planning and another for the provision of observers to obtain that coverage. Once the scope of work and funding are identified, NMFS can further develop alternative contract modules for consideration. Details are provided in Section 4.8.

Because Federal contracting must follow well-established procurement processes, the Council is not being asked to make decisions related to the contracting process at this time. Rather, NMFS will keep the public and the Council informed about the process as the scope of work becomes better defined.

Table of Contents

List of Tables

List of Figures

List of Acronyms

ABC	Acceptable Biological Catch
ADF&G	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFMA	Australian Fisheries Management Authority
AFSC	Alaska Fisheries Science Center
AFU	Alaska Fishermen's Union
AP	Advisory Panel
BiOp	Biological Opinion
BSAI	Bering Sea and Aleutian Islands Management Area
CBA	Collective Bargaining Agreement
CEQ	Council on Environmental Quality
CEY	Constant Exploitation Yield
CDQ	Community Development Quota
CH	Critical habitat
CP	Catcher processor
CV	Catcher vessel
DOL	Department of Labor
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FLSA	Fair Labor Standards Act
FMP	Fishery Management Plan
FONSI	Finding of no significant impact
GCAK	NOAA General Counsel, Alaska Region
GHL	Guideline Harvest Level
GOA	Gulf of Alaska Management Area
GRS	Groundfish Retention Standard
HAPC	Habitat Area of Particular Concern
H&G	Head and gut processing
IPHC	International Pacific Halibut Commission
IRFA	Initial Regulatory Flexibility Act
ITS	Incidental Take Statement
JPA	Joint Partnership Agreement
LOA	Length overall
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
mt	metric ton
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
OAC	Observer Advisory Committee
PSC	Prohibited Species Catch
PSEIS	Programmatic Supplemental Environmental Impact Statement
PSMFC	Pacific States Marine Fisheries Commission

RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation Report
SCA	Service Contract Act
SPELR	Shoreside Processor Electronic Logbook Report
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
USFWS	U.S. Fish and Wildlife Service
WASC	NOAA Western Administrative Support Center

Chapter 1 Purpose and Need

1.1 Introduction

The groundfish fisheries in the Exclusive Economic Zone (EEZ) off Alaska are managed by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Under the authority of the MSA, the North Pacific Fishery Management Council (Council) developed Fishery Management Plans (FMPs) for the groundfish fisheries of the Gulf of Alaska management area (GOA) and Bering Sea Aleutian Islands management area (BSAI). These FMPs were approved by the Secretary of Commerce and became effective in 1978 and 1982, respectively. The FMPs for the GOA and BSAI groundfish fisheries have each been amended more than 50 times. The Pacific halibut fishery off Alaska is managed by NMFS under the authority of the Northern Pacific Halibut Act of 1982, and in coordination with annual fishery management measures adopted by the International Pacific Halibut Commission (IPHC) under the Convention between the United States and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea.

This draft Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) is intended to provide decision-makers and the public with an evaluation of the environmental and economic effects of an FMP amendment to restructure the North Pacific Groundfish Observer Program (Observer Program) to address a variety of longstanding issues. The National Environmental Policy Act of 1969 (NEPA), Executive Order 12866 (E.O. 12866), and the Regulatory Flexibility Act (RFA), require a description of the purpose and need for the proposed action as well as a description of alternative actions which may address the problem. This information is included in Chapter 1 and Chapter 2 of this document. Chapter 3 contains information on the impacts of the alternatives on the affected environment as required by NEPA. Impacts on endangered species and marine mammals are specifically addressed. Chapter 4 contains the Regulatory Impact Review (RIR), which addresses the requirements of E. O. 12866 and describes the economic effects of the alternatives. In future versions of this document, Chapter 5 will address the specific requirements of Magnuson-Stevens Act (MSA), the RFA, and other applicable laws.

The analysis examines seven alternatives, six of which would create a new system for procuring and deploying observers in the groundfish and halibut fisheries of the North Pacific. All of the action alternatives would replace the current pay-as-you-go system (where vessels contract directly with observer providers to meet coverage levels specified in regulation) with a new program, supported by broad-based user fees and/or direct Federal subsidies, in which NMFS would contract directly for observer coverage, and would be responsible for determining when and where observers should be deployed. Under this new program, vessel operators in fisheries will less than 100% coverage would no longer be responsible for obtaining certain levels of observer coverage specified in regulation, but instead, will be required to carry observers when requested to do so by NMFS. Vessels and processors in fisheries that require 100% or 200% coverage will continue to operate much the same as they do today except that NMFS will be responsible for observer procurement rather than the fishing companies themselves.

1.1.1 Background on the Observer Program

NMFS began placing observers on foreign fishing vessels operating off the northwest and Alaskan coasts in 1973, creating the North Pacific Foreign Fisheries Observer Program. Initially, observers were placed on vessels only upon invitation by host countries. In the early years of the program, the primary purpose of observers was to determine incidental catch rates of Pacific halibut in groundfish catches and to verify catch statistics in the Japanese crab fishery. Later, observers collected data on the incidence of king crab, tanner crab, and Pacific salmon, and obtained biological data on other important species. Following the

implementation of the MSA in 1976, which mandated that foreign vessels accept observers, observer coverage greatly expanded.

In 1978, American fishermen began fishing for groundfish in joint ventures with foreign processing vessels. By 1986, all foreign fishing operations were halted, and by 1991, all foreign joint-venture processing within the EEZ of the Bering Sea and Gulf of Alaska was terminated. NMFS began placing observers on domestic vessels in 1986. This was in support of an industry-funded data gathering program on domestic vessels fishing in an area of the Bering Sea north of Port Miller where bycatch of red king crab was of concern. Other small-scale domestic observer programs were implemented during the late 1980s.

The current domestic observer program was authorized in 1989 when the Secretary approved Amendments 13 and 18 to the groundfish FMPs for the BSAI and GOA, respectively. An Observer Plan to implement the program was prepared by the Secretary in consultation with the Council and implemented by NMFS, effective February 7, 1990 (55 FR 4839, February 12, 1990). An EA/RIR prepared for Amendments 13/18 examined the environmental and economic effects of the new program. Under this program, NMFS provides operational oversight, certification training, definition of observer sampling duties and methods, debriefing of observers, and management of the data. Although the vessel and plant owners pay for the cost of the observers, the costs associated with managing the program are paid for by the Federal government.

Under the 1990 Observer Plan, groundfish vessels under 60' length overall (LOA) are not required to carry observers, groundfish vessels longer than 60' and shorter than 125' are required to carry observers 30% of their fishing time, and groundfish vessels 125' and longer are required to carry observers 100% of their fishing time. Shoreside processors that process between 500 mt and 1000 mt of groundfish in a calendar month are required to have observers 30% of the days that they receive or process groundfish. Shoreside processors that process 1000 mt or more of groundfish in a calendar month are required to have observers 100% of the days that they receive or process groundfish. These coverage levels have been increased to implement certain limited access programs with increased monitoring needs, such as the Western Alaska Community Development Quota (CDQ) Program and the American Fisheries Act (AFA) pollock fishery. However, aside from the CDQ and AFA programs, coverage requirements for the groundfish fleets of the BSAI and GOA have remained largely unchanged since 1990, except that coverage requirements for vessels 125' and over using pot gear were reduced to 30%. Since 1990, the number of observer deployment days per year ranged from about 20,000 to almost 36,400 in 2002. In 2002, 340 individual observers served on board 312 vessels and 20 processing facilities.

Table 1.1-1 Current observer requirements in Federal regulations.

Vessel/processor type	*Observer Requirement*	*Regulation*[1]
halibut vessels	0% (no observer requirement)	n/a
groundfish vessels <60' LOA	0% (no observer requirement)	n/a
groundfish vessels ≥60 and <125' LOA and pot vessels of any length	30% of their pot retrievals by quarter and one entire trip per quarter	50 CFR 679.50(c)(1)
groundfish vessels ≥125' LOA (With the exception of pot gear. See above.)	100% of their fishing time	50 CFR 679.50(c)(1)
motherships and shoreside processors that process 500-1000 mt of groundfish in a calendar month	30% of the days they receive or process groundfish	50 CFR 679.50(c)(1)
motherships, stationary floating processors, and shoreside processors that process ≥1000 mt of groundfish in a calendar month	100% of the days they receive or process groundfish	50 CFR 679.50(c)(1)
CPs fishing for Atka mackerel in the Aleutian Islands Subarea	200%	50 CFR 679.50(c)(1)
AFA CPs, motherships, and shoreside processors	200%	50 CFR 679.50(c)(5)
CDQ CPs (trawl and hook-and-line)	200%	50 CFR 679.50(c)(4)
CDQ pot CPs	100%	50 CFR 679.50(c)(4)
CDQ fixed gear CVs and trawl CVs ≥60'	100%	50 CFR 679.50(c)(4)

[1]See 50 CFR 679.50 for further details on current observer requirements. Regulations effective through 12/31/07.

In designing the Observer Program in 1989, NMFS and the Council had limited options because the MSA provided no authority to charge the domestic industry fees to pay for the cost of observers, and Congress provided no funds to cover the cost of observers. The need for observers and the data they provide was sufficiently critical and urgent that the Council and NMFS decided not to wait for the MSA to be amended, and instead proceeded with Observer Program regulations under Amendments 13/18. These regulations, which were considered "interim" at the time, established observer coverage requirements for vessels and processors participating in the BSAI and GOA groundfish fisheries, and required those vessels and processors to arrange for observer services from an observer contractor certified by NMFS.

1.1.2 Previous attempts to restructure the program

After implementation of the "interim" observer program in 1990, NMFS and the Council, recognizing its limitations, began to develop a new program (Research Plan) incorporating a concept which would require all fishery participants to pay a fee based on the revenue from their catch. Collection of this fee was authorized by an amendment to the MSA. Under the Research Plan, NMFS would collect the fee and would contract directly with observer companies, thus removing the direct link between the fishing industry and the observer contractors. The Council adopted the Research Plan in 1992 and NMFS approved and implemented this program in 1994. During 1995, over $5.5 million was collected to capitalize the North Pacific Fisheries Observer Fund.

Over the period the Research Plan was developed and implemented, industry concerns about the program arose. These issues included:

- Redistribution of costs for observer services that resulted from the collection of fees based on a percentage of ex-vessel revenue;

- Industry concerns about unlimited observer costs in the event observer coverage beyond that funded by fees continued to be required of some vessels participating in specific management programs;

- The amount of observer coverage that could be funded under the Research Plan fee collection program was limited and could constrain the development of programs under consideration by the Council that would require increased observer coverage;

- Increased costs of observer coverage due to the contractual arrangements between NMFS and observer companies that would fall under the Services Contract Act. Under this act, a company under contract to the Federal government must pay a wage at least comparable to the union wage, or if there is no established union wage for a particular type of work, the contractor must pay a wage at least as high as the wage standard established by the Department of Labor for that type of work.

After consideration of these concerns, the Council voted to repeal the Research Plan at its December 1995 meeting and refund the fees collected from the 1995 fisheries. At the same meeting, the Council directed NMFS to develop a new plan to address the data integrity issues the Research Plan was intended to resolve. Under the new concept endorsed by the Council, fishing operations required to obtain observers would continue to pay coverage costs, but payment would be made to a third party. The third party would enter into subcontracts with observer companies and direct each vessel and processor to a specified observer provider for services. Payments received by the third party would be used to pay observer contractors for providing observer services and to cover administrative costs.

At its April 1996 meeting, the Council adopted an interim groundfish Observer Program that superseded the Research Plan and authorized mandatory groundfish observer coverage requirements through 1997. The interim groundfish Observer Program extended 1996 groundfish observer coverage requirements as well as vessel and processor responsibilities relating to the Observer Program through December 31, 1997. The interim program continued to require that vessels and processors participating in the BSAI and GOA groundfish fisheries arrange for observer services from an observer contractor certified by NMFS.

During 1997, observers organized to bargain for better compensation and working conditions. Currently, the Alaska Fishermen's Union (AFU) has contracts with three of the four active observer providers in the North Pacific. Also during 1997, NMFS began to develop with Pacific States Marine Fisheries Commission (PSMFC) the concept of a joint partnership agreement (JPA) under which PSMFC would provide the third party procurement functions envisioned by the Council. At its June 1997 meeting, the Council endorsed the continued development of a JPA with the goal of taking final action on the third party program early in 1998 so that a new program could be implemented by 1999. The JPA arrangement could not be developed and implemented prior to 1998, thus, the Council voted to extend the interim Observer Program though 1998.

At its December 1997 meeting, the Council recommended that NMFS and PSMFC continue to develop a JPA that would authorize PSMFC to provide observer procurement services. The Council also requested NMFS to work with the Council's Observer Advisory Committee (OAC) to again develop a fee collection

program. The Council anticipated that the JPA would be effective by 1999 and that a fee collection program would be implemented as soon as possible thereafter.

However, an unresolvable legal issue was identified by PSMFC that forestalled efforts to proceed with the JPA. Under the JPA, PSMFC would have been responsible for providing observer services to the industry and for the deployment of observers onboard vessels and at shoreside processing facilities. NMFS also envisioned that PSMFC would have ensured that observers be available to NMFS through the completion of the debriefing process. PSMFC determined that the legal risk associated with its role as a third party to observer procurement arrangements was too high. Furthermore, NMFS could not sufficiently indemnify PSMFC against legal challenge because (1) no statutory authority for such indemnification exists, and (2) the Anti-Deficiency Act precludes open-ended indemnification. Regulations developed to implement the JPA were thought to be able to deflect potential lawsuits away from PSMFC to NMFS but, could not sufficiently reduce the potential for lawsuit in a manner that would allow PSMFC to go forward with the JPA as endorsed by the Council.

1.1.3 Extensions of the Interim Program since 1998

With the demise of the JPA as a viable alternative to the interim Observer Program, the OAC and the Council, as well as NMFS, continued to advocate pursuit of an appropriate program structure that would address the issues that the Research Plan and the JPA were intended to resolve. Subsequently, the interim program was extended in 1998, to expire December 31, 2000.

In 2000, the interim Observer Program was once again extended for two years with an expiration date of December 31, 2002. This was approved with the expectation that a restructured program would be developed and implemented by that date. The anticipated restructured program was expected to address the concerns set forth by the administrative record which provided the justification and impetus for the development of the Research Plan and the Joint Partnership Agreement, as well as address the concerns that brought about the demise of the Research Plan and JPA initiatives. NMFS has been working with the OAC since March 2000 to develop a program structure as an alternative to the Research Plan, JPA, and the current program.

In 2002, the interim Observer Program was once again extended, this time with an expiration date of 2007. The 2002 amendments to the interim program were an attempt to de-link the more difficult and controversial restructuring issues from the more straightforward administrative changes to the program. The 2002 extension of the program included a variety of new measures to increase the effectiveness of the interim program while restructuring efforts were ongoing. These included: (1) changes to the observer certification and decertification process to ensure that it is compliant with the APA; (2) changes to the observer certification criteria and standards of behavior to clarify and strengthen these regulations; (3) replacement of the observer provider (contractor) certification and decertification process with an APA compliant permitting process similar to that used for other NMFS Alaska Region permits; (4) changes to the duties and responsibilities of observer providers in order to eliminate ambiguities and to strengthen the regulations governing the relationship between NMFS and the observer providers, and (5) authorizing NMFS to place NMFS staff and other qualified persons at any plant that receives groundfish and on any vessel that currently is required to have observer coverage. Thus, under the most recent amendment to extend the interim Observer Program, the current program will expire on December 31, 2007.[1]

[1] 67 FR 72595, December 26, 2002.

1.2 Purpose and need for action

The North Pacific Groundfish Observer Program is the largest observer program in the United States and plays a critical role in the conservation and management of groundfish, other living marine resources, and their habitat. Data collected by the Observer Program are used for a wide variety of purposes including: (1) stock assessment; (2) monitoring groundfish quotas; (3) monitoring the bycatch of groundfish and non-groundfish species; (4) assessing the effects of the groundfish fishery on other living marine resources and their habitat; and (5) assessing methods intended to improve the conservation and management of groundfish and other living marine resources.

The mission of the observer program is to provide the highest quality data to promote stewardship of the North Pacific living marine resources for the benefit of the nation. The goal of the observer program is to provide information essential for the management of sustainable fisheries, associated protected resources, and marine habitat in the North Pacific. This goal is supported by objectives that include:

1. Provide accurate and precise catch, bycatch, and biological information for conservation and management of groundfish resources and the protection of marine mammals, seabirds, and protected species.
2. Provide information to monitor and promote compliance with NOAA regulations and other applicable programs.
3. Support NMFS and the Council policy development and decision making.
4. Foster and maintain effective communications.
5. Conduct research to support the mission of the North Pacific Groundfish Observer Program.

The Observer Program has an integral role in the management of North Pacific fisheries. Information collected by observers is used by managers, scientists, enforcement agents, and other agencies in supporting their own missions. Observers provide catch information for quota monitoring and management of groundfish and prohibited species, biological data and samples for use in stock assessment analyses, information to document and reduce fishery interactions with protected resources, and information and samples used in marine ecosystem research. The Observer Program provides information, analyses, and support in the development of proposed policy and management measures. Further, observers interact with the fishing industry on a daily basis and the Observer Program strives to promote constructive communication between the agency and interested parties. Observations are used by mangers and enforcement personnel to document the effectiveness of the management programs of various entities including NMFS, the U.S. Coast Guard, and the U.S. Fish and Wildlife Service. In order to provide these services, the Observer Program Office routinely conducts research projects and analyses designed to assess the efficacy of management programs.

The proposed action is intended to address a variety of longstanding issues associated with the existing system of observer procurement and deployment. At its October 2002 meeting, the Council tasked its OAC to develop a problem statement and alternatives for restructuring the Observer Program, to be presented at the February 2003 Council meeting. In order to facilitate further progress by the committee, NMFS developed a discussion paper[2] that included a general discussion of issues and alternatives related to the restructuring of the Observer Program. The OAC met January 23-24, 2003, with the primary purpose of reviewing this paper, drafting a problem statement, and providing recommendations to the Council. At its February meeting, the Council reviewed the discussion paper and the draft OAC report (available on the Council website) and approved the following problem statement for restructuring the Observer Program:

[2] Discussion paper on Options for Observer Program Restructuring, NMFS Alaska Region, January 21, 2003.

Observer Program Restructuring Problem Statement

> *The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives.*

Since earlier attempts to restructure the program had not been successful, NMFS, Council staff, and the OAC began to consider a stepwise approach. This was based on the concept that it might be effective to undertake a less ambitious restructuring effort focused primarily on those regions and fisheries where the problems of cost-equity and coverage are most acute. The intent was that once a restructured program had been implemented successfully for some fisheries, the Council could decide whether or not to proceed with expanding the program to include additional fisheries. The initial alternatives approved by the Council in April 2003 reflected this approach, and focused primarily on the groundfish and halibut fisheries of the GOA, with options to include BSAI groundfish vessels that currently have less than 100% coverage requirements. In December 2003, the Council reviewed a preliminary draft analysis of the impact of those alternatives.

As NMFS began to evaluate alternatives under this scenario, however, it became concerned that certain operational and data quality issues would be difficult to resolve under a "hybrid" system and that, in fact, some of these problems would likely become exacerbated under such a system. NMFS described its concerns in a letter provided to the Council for its December 2003 meeting. First, NMFS identified a range of operational and data quality issues associated with the current model. These included the agency's inability to determine where and when observer coverage takes place on less-than-100% observed sectors of the fleet, inability to match observer skill level with deployment complexity, inability to reduce observer coverage for sectors of the fleet that are now subject to 100% or greater coverage levels, and the inability to implement technological innovations which might meet monitoring needs while reducing observer coverage costs and expenses.

Secondly, this letter outlined concerns with the proposed alternatives for a new system, highlighting the consequences of possible differences in observer remuneration under a system which provided observer services through government contract with observer companies to some fishing sectors and through industry contracts with observer companies in other sectors. The observer remuneration issues were based on an agency policy on observer compensation which is described in a November 2003 memo from NMFS Headquarters.[3] In addition, NMFS identified complex factors associated with properly and

[3] Memo from William Hogarth to Terry Lee, November 13, 2003. See Appendix II.

consistently maintaining observer and contractor performance under a hybrid program with two different service delivery models.

Thus, in addition to reviewing the preliminary draft analysis in December 2003, the Council received the letter from NMFS described above, which detailed potential issues of concern related to observer certification/decertification and the application of a new NMFS policy which defines wage rates and overtime requirements for observers under service delivery models that include direct contracts between NMFS and observer providers. NMFS requested additional time to address these issues, in order to determine whether the agency could support a hybrid program in which some vessels (primarily BSAI vessels) would operate under the current pay-as-you-go model, and the remaining vessels (primarily GOA vessels) would operate under the new contract system. Due to the above concerns, the Council did not take any formal action in December 2003, and scheduled an update at its February 2004 meeting and an OAC meeting in March.

At the February 2004 Council meeting, NMFS provided a subsequent letter to the Council stating that the agency had determined that effective procedures for addressing observer performance and data quality issues could only be addressed through a service delivery model that provided direct contractual arrangements between NMFS and the observer providers. NMFS thus recommended that the Council include an additional alternative to the draft analysis that would apply the proposed direct contract model program-wide, so that all observer services in both the BSAI and the GOA would be provided by observer companies through direct contracts with NMFS.

Upon review of the NMFS letter at its February meeting, the Council tasked the OAC at its upcoming meeting to explore new alternatives that address the issue of combining the BSAI and the GOA as one comprehensive observer program, including the concept of a direct NMFS contract with observer providers. The impetus for considering a program-wide alternative was twofold. The first was in response to the above mentioned agency concerns regarding operational and data quality factors. The second was in response to concerns raised by the NMFS policy memo on observer remuneration. This memo was also discussed at the February 2004 Council meeting. The policy maintained that fisheries observers are eligible for overtime compensation under the Service Contract Act (SCA), the Fair Labor Standards Act (FLSA), and other Acts stipulating wages and benefits for employees contracted by the government. As part of the Council's February 2004 motion, the Council sent a letter to NMFS HQ requesting reconsideration of this policy and clarification as to how this policy would affect observer compensation costs under a direct contract approach, as was proposed in the draft analysis for the Observer Program in the North Pacific.[4] An initial response was received on March 8, recognizing the issues identified by the Council but concluding that the agency could not provide a timely response, due to ongoing litigation in U.S. District Court related to these issues.[5]

At the OAC's March 11-12 2004 meeting, the committee addressed the major issues requested by the Council, with the understanding that further information on observer compensation issues and the cost implications of NMFS' recent policy were necessary (and at the time, unavailable) to understand the impacts of any of the existing or new alternatives. The primary recommendations of the committee, detailed in the OAC report, included the addition of two new alternatives (and suboptions) for analysis which included specific BSAI fleets that may also experience disproportionately high observer costs or have modes of operation that would make it difficult to retain observer services under two different programs in the BSAI and GOA. However, the committee did not recommend including a program-wide alternative for all BSAI and GOA vessels and processors. Members generally expressed concern that there had not been sufficient explanation provided as to why NMFS cannot implement two separate

[4] Letter from Chris Oliver to William Hogarth, February 11, 2004.
[5] Letter from William Hogarth to Chris Oliver, March 8, 2004.

programs in the GOA and the BSAI, and there was a general disinclination to add new fleets into a direct contract system which would invoke the SCA and increase costs to an unknown extent. Some committee members also did not want to delay action to mitigate the problems in the GOA fisheries by including the BSAI, and discussed the possibility of, but did not recommend, developing a separate problem statement and amendment package for the BSAI.

The Council reviewed the OAC recommendations at its April 2004 meeting, as well as another letter from NMFS that was submitted to the Council in late March. This letter reiterated NMFS's concerns with having two separate programs in the BSAI and the GOA, and again recommended a program-wide alternative for analysis. The Council ultimately approved both of the OAC's newly proposed alternatives and the program-wide alternative recommended by NMFS. **The result is that the Council expanded the suite of alternatives to include the major fisheries of the BSAI.**

In June 2004, the Council also provided options to consider an alternative type of fee for analysis for the alternatives that include the major fisheries of the BSAI (other than a fee based on ex-vessel value). Many of the BSAI fisheries require individual vessel or cooperative level monitoring, and thus require 100% or greater observer coverage as mandated by law or by the provisions of a specific management program. **For these fisheries, the Council determined it would be appropriate to analyze a type of fee which can exactly match the costs of observer coverage, and thus avoid the potential for reducing coverage levels to respond to revenue shortfalls. Thus, in June 2004, the Council approved options to consider a daily observer fee for those BSAI fisheries that have 100% or greater coverage requirements for their specific management programs.** These options were incorporated to create the existing suite of alternatives and options under consideration in this document.[6]

Finally, in February 2005, the NMFS Alaska Region and NPGOP sent a memo to NMFS Headquarters requesting concurrence with its determination that North Pacific groundfish observers should be classified as professionals under the FLSA.[7] This determination, if upheld, would make observers exempt from the overtime provisions of the FLSA. To date, a response has not yet been received. Additional information on this subject is contained in Chapter 4.

[6] Note that a subsequent letter from NOAA Fisheries regarding observer remuneration was received by the Council on September 27, 2004. This letter noted that consultation with the Dept. of Commerce General Counsel and the Dept. of Labor (DOL) resulted in the determination that NMFS has limited responsibility with respect to observer remuneration. The DOL's Wage and Hour Division is the primary Federal agency responsible for enforcing the SCA and FLSA, and the DOL regulations do not relate directly to the circumstances of fishery observers whose tour of duty may exceed 24 hours. NMFS thus recognizes that further guidance may be useful regarding these requirements and how they pertain to fishery observers. The DOL offered to provide training and guidance to NOAA contracting officers, observer providers, and other interested parties as appropriate on the SCA and FLSA. Information from these sessions would be summarized and made available to the public. These sessions were scheduled for February 2005, but were cancelled by the DOL. They have not been rescheduled.

[7] Memo from James Balsiger and Douglas DeMaster to William Hogarth, February 4, 2005. See Appendix II.

Chapter 2 Description of the Alternatives

The alternatives and program elements analyzed in this document are described in this chapter. All of the alternatives would replace the current pay-as-you-go system (where vessels contract directly with observer providers to meet coverage levels specified in regulation) with a new system, supported by broad-based user fees and/or direct Federal subsidies, in which NMFS would contract directly for observer coverage, and would be responsible for determining when and where observers should be deployed. Six alternative approaches for restructuring the Observer Program are analyzed in addition to the no action alternative. The six action alternatives are distinguished primarily by which fisheries would be included in the program, and are organized in ascending order from the smallest to the largest in terms of scope. Each alternative represents a comprehensive program constructed from the **following five program elements**:

- **Scope**: Which vessels and processors would be included in the program?
- **Coverage requirements:** What levels of coverage would be required for each vessel, processor, or fishery category?
- **Funding mechanism:** How would the costs of observer coverage be funded?
- **Technological/equipment requirements:** What types of equipment and technologies would vessels be required to deploy in order to facilitate coverage by observers?
- **Contracting process:** How would NMFS contract with observer providers to obtain observer coverage?

Two underlying principles guide the construction of all of the alternatives; scalability and adaptability. Should the preferred alternative not include all of the GOA and BSAI fisheries, the restructured program should still be flexible enough so that it could be expanded to include additional fisheries or management areas in the future without major modifications. One of the primary considerations in designing a modified observer program for the groundfish fisheries was to make it sufficiently flexible to accommodate future expansion into other fisheries that may not be selected in the preferred alternative at final action. Secondly, the restructured program should be flexible enough to accommodate potential new management programs, such as GOA rationalization, without wholesale modification. The Council is currently considering a host of rationalization-oriented management proposals for GOA and BSAI fisheries and it makes little sense to design a new Observer Program that is not compatible with these new management proposals.

Any comprehensive restructuring of the Observer Program that addresses the problem statement by eliminating the current "pay-as-you-go" funding mechanism and providing NMFS with the flexibility through direct Federal contracting to determine when and where observers are deployed, must contain a variety of program elements. **Many of these program elements contain additional decision points that are not exclusive to a particular alternative but that are common to all of the alternatives. The required program elements and associated decision points are discussed in sections 2.2 through 2.6.**

2.1 Summary of the alternatives

The six action alternatives are distinguished primarily in terms of scope (i.e. which vessels and processors would be included in the program) and by the structure of the fee collection program. The alternatives under consideration are as follows:

Alternative 1. ***No action alternative***. Under this alternative, the current interim "pay-as-you-go" program would continue to be the only system under which groundfish observers would be provided in the groundfish fisheries of the BSAI and GOA. Regulations authorizing the current program expire at the end of 2007, meaning that no-action is not a viable alternative over the long-term. For this reason, NMFS recommends the addition of an option to extend indefinitely the existing program for all fisheries not covered by the preferred alternative. See Option 8 below.

Alternative 2. ***GOA groundfish vessels only.*** Under this alternative, a new fee-based program would be established for GOA groundfish vessels, including GOA groundfish vessels under 60'. Regulations that divide the fleet into 0%, 30%, and 100% coverage categories would no longer apply to vessels in the program, and vessel operators would no longer be responsible for obtaining their own observer coverage. Under the new program, NMFS would determine when and where to deploy observers based on data collection and monitoring needs and would contract directly for observers using fee proceeds and/or direct Federal funding. Vessels would only be required to carry an observer when one is provided by NMFS. The fee would be based on a percentage of the ex-vessel value of each vessel's GOA groundfish landings and would be collected through annual billing by NMFS.

Alternative 3. ***GOA groundfish vessels and halibut vessels only.*** This expands on Alternative 2 by including halibut vessels from all areas off Alaska. Fees would be collected from halibut landings as well as groundfish landings through annual billing by NMFS, and NMFS would have the authority to place observers on halibut vessels as well as groundfish vessels.

Alternative 4. ***GOA groundfish vessels, halibut vessels and GOA-based groundfish processors.*** This alternative expands on Alternative 3 by including GOA-based groundfish processors. However, in contrast to Alternatives 2 and 3, fees would be collected by processors at the time of landing, and fee proceeds would be submitted to NMFS on a quarterly basis.

Alternative 5. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, BSAI fixed gear catcher vessels (CVs), jig vessels, and BSAI pot vessels.*** This alternative expands on Alternative 4 by including BSAI fixed gear CVs (longline and pot), jig vessels, and BSAI pot catcher processors (CPs).

Alternative 6. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, all BSAI groundfish vessels under 125', and all BSAI pot vessels.*** This alternative expands on Alternative 5 by adding BSAI trawl CVs under 125', and BSAI trawl and longline CPs under 125'. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

Option 1: **Include longline CPs ≥125'**. This suboption would expand Alternative 6 by including longline CPs ≥125 operating in the BSAI.

Option 2: **Include non-AFA trawl CPs ≥125'**. This suboption would expand Alternative 6 by including non-AFA trawl CPs ≥125'.

Option 3: **Include BSAI trawl CVs ≥125'**. (Staff recommend inclusion of this option). Adding this option would allow all CVs operating in the BSAI to be covered under a single uniform program. Without this option, the predominantly AFA CV fleet (<125' and ≥125') operating in the BSAI would be split between two separate observer programs despite the fact that the two classes of vessels would in many cases be fishing side-by-side and delivering to the same processors.

Alternative 7. ***Comprehensive alternative: All groundfish vessels and processors and all halibut vessels.*** This alternative would establish a new fee-based Observer Program in which NMFS has a direct contract with observer providers for all GOA and BSAI groundfish and halibut vessels in the Federal fisheries. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

In developing the alternatives, the Council also included several options that may be applied to more than one alternative:

Option 4: **Exclude GOA-based inshore processors**. (Alternatives 5 and 6). This option would exclude GOA-based inshore processors from the program under Alternatives 5 and 6. The effect of the alternative would be to establish a vessel-only program for the covered fisheries in the GOA and BSAI.

Option 5: **Establish an opt-in, opt-out provision for BSAI-based inshore processors**. (Alternatives 4 through 6). This option applies only if Option 4 is rejected. This option would allow each BSAI-based processor to determine for itself whether to opt-in or opt-out of the program. Processors opting into the program would pay observer fees on all groundfish and halibut landings they receive and would receive their observer coverage through the program. Processors electing to opt-out would pay observer fees on only those landings received from vessels that are participating in the program and would pay no fees on landings from vessels that are not participating in the program. The rationale behind this option is to provide certain BSAI-based processors with the option to join the program should they find that the majority of their landings are from vessels covered by the program. Each BSAI-based processor would have the opportunity to decide whether it makes sense to participate in the program based on how many of its deliveries are from vessels covered by the program.

Option 6: **Include CDQ fishing for participating vessels** (Alternatives 5 and 6). Under this option, vessels that participate in the program when fishing in non-CDQ fisheries would continue to be included in the program when fishing CDQ. This option would allow vessel operators to obtain their coverage through a single program throughout the fishing year and would allow them to switch back and forth between CDQ and non-CDQ fisheries without changing observers. Without this option, vessel operators could be forced to switch observers and observer providers when switching between CDQ and non-CDQ fishing and would be obligated to pay two separate types of fees depending upon whether the vessel is fishing CDQ or non-CDQ.

An additional option applies to the type of fee program selected.

Option 7: **Uniform fee program.** (Alternatives 6 and 7) Under this option, a uniform ex-vessel value fee would be required for all vessels and processors covered by the program in place of the two separate fee programs that are contained in Alternatives 6 and 7. Adoption of this option in conjunction with Alternative 7 would establish a program similar to the Research Plan that was implemented in 1994 and repealed in 1995.

Finally, NMFS recommends inclusion of an option to address the expiration of the existing program for fisheries not covered under the preferred alternative.

Option 8: **Remove 2007 expiration date for no action fisheries.** Under this option, the December 31, 2007 expiration date for the current program would be removed. This means that under Alternatives 2 through 6, the Council's preferred alternative would establish two permanent programs: (1) a new program for those vessels or fisheries covered by the action alternative, and (2) the permanent extension of the existing program for fisheries not covered by the action alternative. The purpose of this option is to eliminate the need to immediately begin analysis of an extension of the existing program for fisheries that are not covered by the preferred alternative, should the Council choose an alternative other than Alternative 7.

2.2 Program scope: Which vessels and processors will be included?

The alternatives range in scope from the most minimal program that would include only GOA groundfish vessels (Alternative 2) to a comprehensive program covering all groundfish vessels and processors and all halibut vessels off Alaska (Alternative 7). Recall that vessels and processors participating in CDQ fisheries may be included as an option in the program under each alternative for which they are included for non-CDQ fishing. The options with respect to scope form the basis for the six action alternatives and are displayed in Table 2.2-1 below:

Table 2.2-1 Program scope: Which vessels and processors are included in each alternative?

Vessel/Processor class	*Alt. 2*	*Alt.3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
GOA groundfish vessels	Yes	Yes	Yes	Yes	Yes	Yes
Halibut vessels (all areas)		Yes	Yes	Yes	Yes	Yes
GOA-based inshore processors			Yes	Yes (with Option to exclude)		Yes
BSAI fixed gear CVs				Yes	Yes	Yes
BSAI pot vessels				Yes	Yes	Yes
BSA-based I inshore processors			Each processor may elect to opt-in or opt-out			Yes
BSAI trawl CVs <125'				Yes	Yes	Yes
BSAI trawl CV ≥125'					Option to include	Yes
BSAI longline CPs <125'					Yes	Yes
BSAI trawl CPs <125'					Yes	Yes
BSAI longline CPs ≥125'					Option to include	Yes
BSAI non-AFA trawl CPs ≥125'					Option to include	Yes
AFA inshore processors			Each processor may elect to opt-in or opt-out			Yes
AFA motherships						Yes
AFA CPs						Yes
CDQ vessels and processors				Option to include vessels and processors that are included in the program for their non-CDQ activity		Yes

The analysis does not include an alternative (other than the no action alternative) that would exclude GOA groundfish vessels <60' LOA even though those vessels are not currently required to carry observers. In 1989, when the decision was made to exclude such vessels from any coverage requirements, it was felt that coverage requirements for vessels <60' were not economically viable under the pay-as-you-go program because average annual revenues for vessels <60' are less than one-third as much as average annual revenues for vessels in the 60'-124' size range. However, a fee program based on a percentage of ex-vessel revenues solves the problem of disproportionate costs for smaller vessels and makes their inclusion into the restructured Observer Program more economically feasible.

Alternatives 4-6 contain an opt-in/opt-out provision for BSAI-based shoreside processors that take deliveries of groundfish from vessels covered by the program that merits further explanation. Most BSAI-based shoreside processors receive the great majority of their groundfish deliveries from vessels fishing in BSAI groundfish fisheries (especially AFA pollock), and only incidentally take deliveries of GOA

groundfish. Therefore, the observers working at these plants spend the great majority of their time observing AFA pollock deliveries. A BSAI-based processor choosing to opt-in to the new program would obtain all of its coverage through the new program, and would be required to pay the processor's share of any fees for all groundfish landings, including the processor share of fees on landings by vessels that are not part of the program (i.e. CVs $\geq$125'). A BSAI-based processor choosing to opt-out would not receive observer coverage through the new program but would continue to obtain all of its observer coverage through the existing pay-as-you-go program.

However, a BSAI-based processor choosing to opt-out would still be required to collect fees from vessels making deliveries of groundfish and halibut that are covered by the program, and would be required to submit the processor's share of the fee for such deliveries, but would not submit fees for any groundfish landings by vessels not covered by the program. The purpose of imposing fees on BSAI-based processors choosing to opt-out is to maintain a level playing field for all processors that receive groundfish covered by the program. Otherwise, BSAI-based processors could have a competitive advantage over GOA-based processors that are required to pay the fee, if such an alternative is selected.

2.3 Coverage requirements

The issue of coverage levels arises with the implementation of a program that rescinds the current coverage levels that are based on vessel length and processing volume and replaces them with one in which NMFS has more flexibility to decide when and where to deploy observers. However, some type of organizational structure is still necessary to categorize vessels and processors for the purpose of determining coverage levels. As a replacement for the existing vessel-length based categories, the following four tier system of coverage is proposed. Vessels and processors would be placed into one of the four coverage tiers based on their fishery and operating mode. The purpose of designing this four-tier coverage system is to establish clear and uniform criteria for determining what level of coverage is required in each fishery. **The determination of which fishery sectors are placed into which tier is a decision point at final action.**

The establishment of uniform criteria for determining coverage requirements will also assist the Council in determining what levels of coverage are necessary when new management programs are proposed. It should also be noted that placement of a particular fishery or vessel class into a particular coverage tier may, or may not, affect the type or amount of fee that would be assessed. As is elaborated in more detail in Section 2.4, the Council has the option of establishing a uniform ex-vessel value fee that applies to all fisheries within the program, or to establish separate fee programs for fisheries in the different coverage tiers.

The following is a description of the four proposed coverage tiers:

- **Tier 1 fisheries (200% coverage).** These are fisheries in which two observers must be present so that observers are available to sample every haul on processors or delivery on vessels. Tier 1 fisheries are generally those in which observers are directly involved in the accounting of individual vessel catch or bycatch quotas.

- **Tier 2 fisheries (100% coverage).** These are fisheries in which one observer is deployed on each vessel and processor. In contrast to Tier 1, it is recognized that the observer will likely be unable to sample all hauls or deliveries due to workload constraints and will, therefore, follow random sampling procedures so that the vessel or processor will not know in advance which hauls or deliveries will be sampled. Under certain circumstances, vessels that would otherwise qualify for Tier 1 coverage could operate with a single observer in Tier 2 if they are operating under

restricted hours, or under an alternative monitoring plan approved by NMFS in which alternate technologies are used to monitor scales when the observer is absent.

- **Tier 3 fisheries (regular coverage generally less than 100%).** *(This tier replaces the old 30% coverage requirement).* These are fisheries in which NMFS is dependent on observer coverage for inseason management but in which 100% coverage on every vessel is unnecessary because observer data is aggregated across a larger fleet. Vessels participating in Tier 3 fisheries can expect to receive coverage on a regular basis and will be required to carry observers when requested to do so by NMFS. However, the actual coverage that each vessel receives will depend on the coverage priorities established by NMFS and the sampling plan developed for the individual fishery in which the vessel is participating. The actual coverage a particular vessel or processor receives could range from zero to 100%, but on a fleet-wide basis, coverage levels are more likely to average closer to 30%.

- **Tier 4 fisheries (infrequent coverage).** These are fisheries in which NMFS is not dependent on observer data for inseason management. Coverage levels in Tier 4 fisheries are expected to be low and infrequent and used for special data needs and research rather than inseason management. Halibut vessels, jig vessels, and groundfish vessels <60' are likely to fall into Tier 4. In these fisheries, NMFS could deploy observers on vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data. Vessels participating in Tier 4 fisheries would be required to carry observers when requested to do so by NMFS but such requests are unlikely to occur on a regular basis.

Under this new four tier structure, the coverage levels would remain unchanged from the status quo for most vessels and processors that currently have 100% or 200% coverage requirements. The biggest change would occur for vessels that currently have 30% coverage requirements or no coverage requirements. Under the four tier structure, most current 30% vessels would fall into Tier 3 and can expect regular coverage at a level less than 100%. Most vessels that currently have no coverage requirements will fall into Tier 4 and will be required to carry an observer when requested, but can expect such coverage to be a relatively rare occurrence.

In addition, this analysis does not propose an annual mechanism through which a fishery would change from one tier to the next if it is determined that coverage levels need to be increased or decreased. Currently, all coverage levels are established in regulation and any changes to existing coverage requirements must be implemented through notice and comment rulemaking. The Council and NMFS may wish to consider whether a more flexible process is warranted or possible, but this analysis assumes that formal rulemaking would be necessary to change fisheries from one tier to another under the new system. Flexibility would still be substantially increased through the proposed system, however, as the coverage levels for fisheries within Tiers 3 and 4 could be shifted and modified on an inseason basis.

2.3.1 Characteristics of Tier 1 fisheries

Tier 1 fisheries may have several or all of the following characteristics that make it necessary to have an observer available for sampling at all times the vessel or processor is operating. Among these characteristics are:

- *Observer is directly involved in monitoring individual vessel catch quotas*. In both the AFA and CDQ fisheries, observers onboard CPs, motherships, and inshore processors are directly involved in monitoring individual vessel catch quotas. These quotas may take various forms such as CDQ

allocations or AFA co-op allocations and groundfish sideboards. However, the unifying characteristic is that the vessel is operating under an exclusive quota and catch data from each vessel is not aggregated across the fishing fleet.

- *Observer is directly involved in monitoring individual vessel bycatch quotas.* In the CDQ and AFA fisheries, and under the new groundfish retention standards for the BSAI head and gut processing (H&G) fleet, vessels are operating under some form of individual or cooperative based bycatch quotas. In the CDQ fishery, vessels operate under CDQ bycatch allocations. In the AFA fishery, CPs operate under prohibited species catch sideboards that are allocated to each vessel. And in the BSAI H&G trawl fisheries, each CP $\geq$125' will be subject to an individual vessel groundfish retention standard (GRS) under Amendment 79 to the BSAI FMP. Because the GRS functions as a limit on the amount of groundfish that each vessel may discard, it functions as an individual vessel bycatch limit.

- *Catch is being processed and/or discarded and cannot be observed at a later date*. This is a characteristic shared by all CPs in that there is no opportunity for shore-based monitoring because the catch is processed at sea. In contrast, because CVs deliver whole fish to shoreside processors, the monitoring of inshore fisheries can be split between at-sea and shore-based observers.

- *Observer involved in monitoring catch from critical habitat*. On CPs fishing for Atka mackerel in the Aleutian Islands Subarea, observers are directly involved in monitoring removals of Atka mackerel from areas designated as critical habitat for the endangered Steller sea lion. NMFS determined that it was important to have an observer monitor every haul to obtain accurate estimates of removals from critical habitat and avoid a jeopardy finding.

As is displayed in Table 2.2-1, no vessels or processors are proposed to be included in Tier 1 that are not already subject to 200% coverage requirements. However, as new management programs are developed that share the characteristics of Tier 1 fisheries, the number of vessels and processors in Tier 1 could be increased.

2.3.2 Characteristics of Tier 2 fisheries

Tier 2 fisheries share several characteristics that make 100% coverage necessary but that do not elevate coverage requirements to the Tier 1 level.

- *Relatively large volumes of groundfish harvested*. When designing a coverage program for a fleet with disparate levels of groundfish harvested, it makes sense to concentrate coverage on those vessels that harvest the largest volumes of groundfish because doing so ensures that a larger portion of the overall groundfish harvest is observed than would be the case if coverage was distributed randomly, or concentrated on vessels that harvest lower volumes of groundfish. The current 100% coverage requirement, which is based on vessel length, has served as a useful proxy in that vessels greater than 125' tend to harvest larger volumes of groundfish than vessels under 125'. It may be especially important to require 100% coverage on vessels that are both high-volume and that operate independent of a larger fleet across which data can be extrapolated. Trawl CPs $\geq$125' operating in the GOA are an example of high-volume vessels that often operate alone in an area fishing for flatfish or rockfish while the bulk of the shoreside fleet operating in that area is fishing for pollock or Pacific cod. This is the result of inshore/offshore regulations that prevent trawl CPs $\geq$125' from fishing for pollock and Pacific cod in the GOA.

- *Potential for relatively high levels of bycatch*. Trawl CPs operating in the GOA flatfish and rockfish fisheries are examples of vessels that have the potential to catch large quantities of halibut PSC and other species of potential concern such as certain rockfish. In addition, a single large CP may have the harvesting power of several smaller CPs. Therefore, the Council and NMFS may conclude that trawl CPs ≥125' operating in the GOA should continue to have 100% coverage as is currently required under the status quo.

- *At-sea processing precludes alternative monitoring approaches onshore*. Because CPs sort and process catch at sea, catch composition and bycatch data can only be obtained by onboard observers on such vessels. Whereas monitoring of CVs can sometimes be accomplished through a combination of at-sea and shoreside observers.

- *Economically or operationally unable to operate in Tier 1*. Certain small vessels that would otherwise be operating in Tier 1 fisheries may be unable to carry two observers due to economic or operational constraints. In these instances, such vessels may be allowed to operate as Tier 2 vessels but with constraints on either their volume or operating schedule to insure that a single observer is able to handle the volume of groundfish harvested. The new groundfish retention standard (GRS) under Amendment 79 only applies to non-AFA CPs ≥125. The Council chose not to include vessels <125'. The Council motion for Amendment 79 provides for an "alternative scale-use verification plan" which would allow vessels subject to the GRS to submit to NMFS a plan for operating with just one observer where all hauls are monitored under 12/9 hour work day restrictions.

- *Individual catch or bycatch quota monitoring split between vessel and processor*. In some instances, the monitoring of individual vessel quotas on CVs may be split between the vessel and processor where the vessel observer may be monitoring certain aspects of the catch and a plant observer may assist with monitoring the portion of the catch that is retained and delivered. CVs operating in CDQ fisheries fall under this category.

2.3.3 Characteristics of Tier 3 fisheries

Tier 3 fisheries share several characteristics that make regular coverage necessary but that do not elevate coverage requirements to the Tier 1 or Tier 2 level.

- *Observer data used for inseason management purposes*. The primary threshold between Tier 3 and Tier 4 fisheries is that Tier 3 fisheries are those in which observer data is necessary for inseason management of catch or bycatch quotas. Generally, these are the fisheries that currently have 30% coverage requirements. In these fisheries, observer data is used to monitor groundfish catch and discards, and PSC discards. But discard and PSC rates are aggregated across a large fleet, making 100% coverage unnecessary.

- *Vessels not operating under individual bycatch quotas.* In Tier 3 fisheries, vessels are not operating under individual bycatch quotas meaning that bycatch data from observed vessels can be applied to unobserved vessels operating in the same time and area. Therefore, it is not necessary to obtain bycatch data from every vessel in order to generate bycatch estimates for the entire fishery.

- *If vessels are operating under individual catch quotas, monitoring is done onshore*. Even if vessels are operating under a system of individual vessel quotas, 100% coverage may not be necessary if the primary location for catch accounting is the shoreside processor rather than the

vessel. AFA CVs and sablefish IFQ vessels are two examples of vessels that are operating in individual quota-based fisheries where the primary catch accounting is done onshore rather than at-sea. In both of these instances, vessels are subject to a 100% retention requirement for all species for which individual vessel quotas apply to ensure that all fish harvested can be properly accounted for onshore.

2.3.4 Characteristics of Tier 4 fisheries

The remaining groundfish and halibut fisheries that do not fall into Tiers 1 through 3 would be categorized as Tier 4 fisheries. These are fisheries where coverage levels would be low and infrequent, and observer data would be used primarily for special data needs and research rather than inseason management. In these fisheries, NMFS could deploy observers on vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data.

- *Observer data not used for inseason management.* In a variety of fisheries, observer data is not currently used for inseason management purposes and vessels are managed through the use of landings data provided by processors. Examples include the halibut IFQ fishery and the jig fishery.

- *Low volume of fish harvested.* In a variety of fisheries, the volume of groundfish harvested by each vessel is so low that coverage is more efficiently applied to vessels that harvest larger volumes. For example, it may take ten fixed gear vessels <60' to equal the daily volume of a single trawler in the 60'-125' vessel size class. Therefore, an observer operating on a fixed gear vessel <60' would only be able to sample 1/10th of the volume of groundfish as an observer operating on the larger trawl vessel. If necessary, volume thresholds could be established to ensure that only low volume vessels remain in Tier 4 and that small vessels that exceed certain catch tonnage thresholds could be assigned to Tier 3.

2.3.5 Proposed tier classifications for vessels and processors

The proposed classification of each fishery into each of the four tiers is shown in Table 2.3-1. While the tier classifications shown in this table closely match the existing coverage requirements, there are several instances where vessel and processor categories that currently have 100% observer coverage requirements are proposed to be included in Tier 3 (regular coverage less than 100%) instead of Tier 2 (100% coverage). These are noted in the following section.

Table 2.3-1 Proposed tier levels for vessels and processors.

Vessel/processor/fishery	*Current coverage requirement and future coverage requirements proposed under other programs*	*Proposed tier classification*
AFA CPs	200% coverage	Tier1
CDQ CPs	200% coverage	Tier 1
AFA motherships	200% coverage	Tier 1
AFA inshore processors	1 observer for each 12 hour period (i.e. 2 observers if plant operates more than 12 hours/day)	Tier 1
non-AFA trawl H&G vessels ≥125' in the BSAI	100% coverage currently. 200% coverage under Amendment 79 groundfish retention standard (GRS)	Tier 2
CPs fishing for Atka mackerel in the Aleutian Islands Subarea	200% coverage	Tier 1
non-AFA Trawl H&G vessels <125' in the BSAI	30% coverage currently. However, 200% coverage would be required under proposed BSAI Amendment 80 if these vessels joined fishery cooperatives.	Tier 2
non-AFA Trawl H&G vessels ≥125' in the GOA	100% coverage	Tier 2
CVs >60' and pot CPs fishing CDQ	100% coverage	Tier 2
non-AFA Trawl H&G vessels <125' in the GOA	30% coverage	Tier 2
non-AFA inshore processors	0%, 30%, or 100% based on processing volume	Tier 3
Trawl CVs ≥125' (Including CDQ and AFA)	100% coverage	Tier 2 or Tier 3 with possible video monitoring requirement.
Trawl CVs 60'-125' (Including CDQ and AFA)	30% coverage	Tier 3
Longline CPs ≥125'	100% coverage	Tier 2
Longline CPs 60'-125'	30% coverage	Tier 2
Longline CVs 60'-125'	30% coverage	Tier 3
Longline CVs ≥125'	100% coverage	Tier 3
Pot vessels ≥60'	30% coverage	Tier 3
Halibut vessels	no coverage	Tier 4
Jig vessels (all sizes)	no coverage or 30% depending on vessel length	Tier 4
Groundfish vessels <60'	no coverage	Tier 4

2.3.6 Significant changes from the status quo

Under the proposed four-tier structure, most existing fisheries would fall into the tier that relates to their current coverage level with four notable exceptions: (1) CVs ≥125', (2) longline CPs, (3) trawl CPs <125' and (4) non-AFA inshore processors. The rationale for these changes is as follows:

Catcher vessels ≥125'

Most if not all CVs ≥125' are AFA vessels that operate primarily in the AFA pollock and BSAI Pacific cod fisheries. Because such vessels are subject to AFA groundfish sideboards in the GOA, they have only operated to a limited extent in the GOA since the implementation of the AFA. Therefore, the two fisheries of primary interest are the AFA pollock and BSAI Pacific cod fisheries. In both of these fisheries, CVs over and under 125' operate side-by-side and deliver to the same processors and there is no compelling reason to subject these two components of the AFA fleet to different coverage levels. In the case of the pollock fishery, the primary location for catch accounting is the processing plant rather than the vessel, and all pollock landings are weighed on certified scales and observed by a plant observer. The primary task of vessel observers is to collect PSC data (primarily salmon and herring) and to ensure that pollock and Pacific cod are not discarded in violation of full retention requirements. While larger vessels tend to harvest and deliver larger volumes of pollock, the disparity between AFA CVs greater and less than 125' is not sufficient in and of itself to require higher levels of coverage on vessels ≥125'. Some larger CVs have the ability to do extensive at-sea sorting because they load their fish holds via conveyer systems and that raises additional concerns about possible at-sea sorting if observers are not present.

In the BSAI Pacific cod fishery, the operational disparity between AFA CVs greater than and less than 125' is even smaller. In fact, many of the larger AFA CVs have been designed so specifically to operate in the high-volume midwater pollock fishery that they do not generally engage in bottom trawling for Pacific cod because it is less efficient for them to do so than for smaller, more versatile CVs. Consequently, the number of AFA CVs ≥125' that operate in the BSAI Pacific cod fishery is lower than in the AFA pollock fishery and in the Pacific cod fishery there is less disparity in the groundfish volumes harvested by vessels greater than and less than 125'. However, because at-sea discards of pollock is a concern across the entire AFA CV fleet, NMFS believes it may be appropriate to consider including all AFA CVs in the Tier 3 category only with the inclusion of a video monitoring requirement to ensure that catch is not sorted or discarded at sea. But it should be noted that video monitoring faces several unresolved implementation issues including confidentiality and the cost of interpreting the data that have not been resolved A vigorous at-sea video monitoring program for the AFA inshore sector could greatly reduce the number of observers required to monitor this fleet because species composition and PSC monitoring could be accomplished at the processor. The AFA inshore CV fleet may be the most appropriate place in which monitoring technologies such as video could be tested as an alternative to traditional coverage. Additional information on the current state of video monitoring technology is contained in Appendix 1.

Longline CPs <125'

Longline CPs <125' operate primarily in the BSAI Pacific cod fishery, and to a lesser extent in the halibut/sablefish IFQ fishery and GOA Pacific cod fisheries. The longline CP fleet in the BSAI is divided between vessels under and over 125' that currently face 30% and 100% coverage requirements, respectively. In 2003, 10 longline CPs <125' and 29 longline CPs ≥125' operated in the BSAI Pacific cod fishery. However, despite the length difference, these two groups of longline CPs generally operate in an identical manner and often harvest similar volumes of groundfish. This is because some longline CPs were built right up to the 125' size limit and have similar operational capacities as vessels greater than 125'. This is especially the case in the longline fishery where catch per unit effort is less dependent on

horsepower than in the trawl fisheries. In contrast to trawl vessels, the speed at which both longline and pot vessels are able to retrieve gear and harvest fish is more dependent on the skill of the crew than on the horsepower or length of the vessel. For this reason it does not make sense to maintain two separate coverage levels for the freezer longline fleet based on vessel length. Rather, the entire class of longline CPs of all lengths should be assigned to a single tier category so that coverage on this fleet can be managed in a uniform manner. **NMFS has expressed concerns about the ability to obtain viable data on CPs of any length without observers and, therefore, recommends that both trawl and longline CPs <125' be subject to 100% coverage and placed into Tier 2.** The reasons for this proposed increase in observer coverage are described in the next section.

Trawl CPs <125'

In 2003, seven trawl CPs <125' operated in the GOA and two in the BSAI. Under current regulations, these vessels are subject to 30% coverage. Many of these vessels are former CVs that were converted to at-sea processing by adding plate freezers and converting their fish holds into freezer holds. These vessels generally target Pacific cod, flatfish, and rockfish in the GOA and BSAI. Because they process at sea, NMFS is concerned about obtaining accurate catch and bycatch information on these vessels without observers. **Therefore, NMFS recommends assigning these vessels to Tier 2.**

In some situations there are several weeks when CPs <125' operate with no observer coverage. Data that is crucial to managing the fisheries is not available during this time and PSC catch is not accounted for. This raises significant management and potential conservation concerns for NMFS. Using substitute rates does not accurately reflect fishing mortality and may not capture all vessel activity. Vessels fishing in the same area can have significantly different discard and PSC rates. Increasing observer coverage requirements on these vessels would eliminate these data voids by providing managers with a source for estimating PSC and total catch. Additionally, these vessels are only required to submit catch information on a weekly basis, where observers would submit data to NMFS on a daily basis providing a significant improvement in NMFS' ability to manage inseason TAC and PSC catch.

Non-AFA inshore processors

Under the existing regulations, coverage requirements for non-AFA inshore processors are based on processing volume with higher-volume processors subject to 100% observer coverage requirements. Under the proposed new tier classification scheme, all non-AFA inshore processors would be grouped into the Tier 3 category and would be subject to regular observer coverage when requested to receive an observer by NMFS. This will provide NMFS with the flexibility to deploy additional observers at sea if it is determined that at-sea coverage is a higher priority than 100% coverage at all higher-volume inshore processors. Because plant observers at non-AFA plants are not directly involved in catch accounting as they are at AFA plants, and do not collect information used for inseason management purposes, there is a less compelling reason to maintain 100% coverage at all higher-volume processors when such observers may be more useful if deployed elsewhere.

It should be emphasized, however, that inclusion of a fishery in the proposed new four-tier coverage system is dependent on inclusion in the overall restructured Observer Program. In other words, the tier structure would apply only to those fisheries that are included in the preferred alternative. Therefore, the proposed inclusion of CVs and freezer longliners ≥125' in the new Tier 3 classification is dependent on their being included in the preferred alternative. This would only be the case if the Council includes these vessels in the program as an option under Alternative 6, or selects Alternative 7 as the preferred alternative. In all other instances, such vessels would remain in their existing coverage categories under the current pay-as-you-go regulations because they would not be included in the restructured Observer Program.

2.3.7 Inseason deployment issues

Under the proposed tier structure, decisions about when and where to deploy observers will be a major issue in Tier 3 fisheries and a smaller issue in Tier 4 fisheries. In Tier 1 and Tier 2 fisheries, all vessels and processors are required to carry observers at all times and therefore, there will be no need for a decision-making process to determine how to deploy observers. However, a service delivery model which allows NMFS to determine which observers are deployed to which vessels in Tier 1 and Tier 2 fisheries, and therefore insures that the most experienced and highly-skilled observers are placed where they are most needed, will improve overall data quality.

Information on the proposed inseason deployment procedures anticipated to be used by NMFS is provided in Section 4.3. NMFS continues to study alternative methods to optimize the deployment of observers within specific fisheries to maximize the utility of data generated by a given number of observers. Regardless of the results of these studies, NMFS believes that the Observer Program and inseason managers should be provided with the greatest degree of flexibility to manage inseason deployment of observers in an optimal manner.

2.4 Funding mechanism

All of the alternatives contained within this analysis anticipate funding the new observer program through some combination of user fees and direct Federal funding. Federal funding may be necessary to get the program up and running, cover some direct coverage costs if industry fees are inadequate, and cover agency costs associated with implementing and maintaining the program (see above). Therefore, it should be understood that any decisions related to the type of user fee would not preclude the possibility of obtaining Federal funding to cover observer deployment costs. There are several decisions related to the funding mechanism under each alternative. Section 2.4 outlines the primary issues and concepts relevant to the funding mechanism:

- Types of fee (ex-vessel value or daily observer fee)
- Uniform or variable fees
- Supplemental fee options for special programs
- Initial fee percentage
- Process for adjusting fee percentages
- Fee collection mechanism
- Start-up funding and Federal funds
- Restriction on the use of fee proceeds

2.4.1 Principles for a fee program

In considering options for user fees, NMFS, Council staff, and the OAC developed several principles to guide the choice of a funding mechanism:

1. *User fees should be broad-based* in that all participants in the program pay a share. But the fees should also be limited to only those vessels and processors that receive coverage under the program. Fees and coverage under the program should be parallel so that no one receives coverage without paying the fee, but no one has a fee imposed on them without receiving the benefit of coverage under the program. The intent of this objective is twofold: First, to prevent "free riders" who benefit from coverage through the program but do not participate in its funding; and second, to prevent fisheries or sectors that are not participating in the program from having to

subsidize observer coverage for vessels that are participating. For fisheries with less than 100% coverage, this principle would apply at the fleet level rather than individual vessel level in that all vessels would contribute towards financing the program but observers may only be deployed on a subset of vessels within the fleet.

2. *User fees should be fair and equitable*. One of the longstanding criticisms of the current "pay-as-you-go" program is that some operations pay a disproportionately high percentage of their gross revenues for observer costs (and some pay a disproportionately low proportion). In extreme instances, observer costs for a particular vessel may be prohibitive in that they exceed what would otherwise be the vessel's expected net revenues and the vessel owner is precluded from fishing. At the same time, the intent of this objective is also to prevent 'free riders' among industry who benefit from the data used to manage their fishery but who do not participate in funding or have coverage requirements (e.g., halibut boats, <60' boats).

3. *User fees should not be directly linked to actual coverage levels when coverage levels are less than 100%.* It may seem logical to link user fees to the actual coverage needs or coverage levels in a particular fishery. However, one of the problems identified with the current "pay-as-you-go" system is that coverage levels are inflexible and difficult to adjust based on management needs. An important advantage of the proposed restructuring is increased flexibility in determining how observers should be deployed among fisheries. However, if every change in the coverage level for a particular fishery also resulted in a change in the fee for that fishery, then every adjustment of coverage levels would be a politically-charged decision that would require Council action and notice-and-comment rulemaking. Such a system would greatly restrict the flexibility of managers to modify coverage levels in a timely manner to respond to changing management needs. This principle, however, is not relevant to fisheries that have 100% or greater coverage levels mandated in regulation or statute due to their specific individual vessel monitoring needs (e.g., Tier 1 and Tier 2 AFA and CDQ fisheries), as these coverage levels are not expected to change.

4. *User fees should be easy to collect without undue burden on industry.* Vessels and processors are already faced with considerable paperwork and reporting burdens. A new user fee should be designed to work within the current recordkeeping and reporting system to the extent possible without imposing unnecessary new paperwork burdens on industry.

2.4.2 Fee based on percentage of the ex-vessel value of landed catch

While a wide variety of fee types are theoretically possible and could be used to raise funds to support observer coverage, the type of fee that best meets the principles outlined above is a fee based on the ex-vessel value of landed catch. Fees based on the ex-vessel value of landed catch are the most commonly used type of fee in the North Pacific, as both the original Research Plan and the halibut/sablefish IFQ program use such fees. For purposes of this analysis, ex-vessel value fee would be calculated as a percentage of the price paid (both monetary and non-monetary) for shoreside groundfish landings or as a percentage of a standard prices applied to roundweight equivalent for each groundfish species. The use of standard and actual prices is discussed below.

Advantages of an ex-vessel value fee:

- *Equity*. An ex-vessel value fee is perhaps the most equitable method of funding observer coverage because it is based on the value of the resource each operation uses. An ex-vessel value fee is commensurate both to each operation's ability to pay and the benefits received from the fishery. Under the existing pay-as-you-go program, some smaller vessel operators face observer costs that are disproportionately high relative to their revenue, which is a concern identified in the Council's problem statement.

- *Broad-based approach.* An ex-vessel value fee is the easiest type of fee to apply on a universal basis to all participants in the restructured observer program. That is because the fee can be assessed at the time of each landing regardless of how large or small the landing. The current system in which vessels pay for their own coverage exempts all vessels that do not have coverage requirements even though their fisheries are managed by data collected by observers on larger boats that do have required coverage.

- *Predictability*. A fee that is withheld at the time of landing is likely easier for fishermen to predict and plan for because they need not worry about maintaining sufficient funds in the future to pay for coverage. Fees imposed on a yearly or quarterly basis would require fishermen to set-aside sufficient funds to pay for future coverage fees. This may be difficult for some operations that may not know how much revenue to set aside for future fee payments because they may not know how many future fishing days to expect.

- *Easiest to collect.* An ex-vessel value fee that is automatically withheld at the time of landing by the processor would likely be the easiest type of fee to assess and collect because the processor knows how much was paid for the fish. The existing electronic reporting software used by processors to report landings to NMFS could likely be modified by or replaced with a system that automatically generate fee assessments, relieving processors of the task of calculating fee amounts. However, this advantage would not apply if the fee is collected after-the-fact on an annual or quarterly basis by NMFS through direct billing of fishermen.

Disadvantages of an ex-vessel value fee:

- *Fee revenues not directly linked to coverage costs.* Because the fee revenues would not be directly related to observer coverage costs, it is highly likely that the program would experience revenue shortfalls or surpluses relative to the amount of observer coverage desired. The amount of revenue generated by an ex-vessel value fee depends on a variety of factors including: (1) the fee percentage, (2) ex-vessel prices for species covered by the program, and (3) the amount of total landings. Observer coverage costs also depend on various factors including: (1) the daily rate charged by observer providers, (2) the number of vessels participating in a fishery, (3) season lengths, and (4) the desired coverage levels. Given that fee revenues and coverage costs are likely to vary independently from year to year as a result of factors that may be difficult to predict or control, it is unlikely that an ex-vessel value fee program could be designed to exactly match coverage costs.

- *Fee percentages could be difficult to adjust.* Given recent guidance on framework measures, it is unlikely that an ex-vessel value observer fee could be designed so that the fee percentage could be adjusted quickly or automatically. Recent guidance suggests that the fee percentage would need to be established in regulation, and any change in the ex-vessel value fee percentage would require notice and comment rulemaking and economic analysis of the impacts of the proposed

change. Therefore, it is unlikely that fee percentages could be adjusted in a timely manner to account for changing prices, landings, and coverage costs.

Types of fisheries that lend themselves to an ex-vessel value fee program

The type of fisheries for which an ex-vessel value fee may be most appropriate are those in which coverage levels are less than 100%, and observer data is used to estimate activity on unobserved vessels. The Pacific cod fishery in the GOA fits this description in that the catch is split primarily between vessels with 30% coverage requirements and vessels with no coverage requirements. At present, few vessels with 100% coverage requirements participate in this fishery. In the GOA Pacific cod fishery, observer data is used by inseason management primarily to generate fleet-wide halibut bycatch rates for each gear type, and for scientific purposes such as stock assessment.

An ex-vessel value fee would allow NMFS to collect observer funds from all participants in the fishery instead of just the subset of vessels that are required to carry observers, and distribute observers throughout the fishery as appropriate. To some extent, coverage levels could be adjusted to account for fluctuations in revenue without dramatically affecting the ability of NMFS to manage the fishery.

For this reason, a fee based on the ex-vessel value of landed catch is proposed for all Tier 3 and 4 fisheries under Alternatives 2 through 7, and an ex-vessel value fee is included as an option for Tier 1 and Tier 2 fisheries under Alternatives 6 and 7. Ex-vessel value fees are the most commonly-used type of fee in the North Pacific. In sum, the advantages to such a fee are that it is broad-based, perceived to be equitable, and roughly correlated with each operation's ability to pay and level of participation. A fee based on the ex-vessel value of landed catch would be relatively easy to monitor and collect because much of the information necessary to assess such a fee is already collected by NMFS.

Basis for an ex-vessel value fee: Standardized or actual prices?

The Research Plan used a set of standardized prices, by species and gear, upon which to base the fee assessment. Price information from the current year was used to calculate a standard price per pound which would be applied to the following year's landings. Industry was largely opposed to the use of standard prices, preferring to use actual prices when possible. **However, NMFS supported the use of standard prices and continues to do so for several reasons:**

1. Many operations have no price transaction (at-sea processors, for example)
2. Non-monetary compensations or post-season adjustments occur which do not appear on fish tickets
3. Use of actual prices could encourage price reductions, or "under reporting"
4. Projection of revenues, and specification of annual coverage levels, is much more feasible with the use of standardized prices

The use of standardized prices also was a major point of controversy in the development of a cost-recovery (fee) program for the halibut/sablefish IFQ program. NMFS ultimately developed a flexible system under which fishermen were given the choice to report actual prices or use NMFS standardized prices. This approach appears to have addressed major industry concerns about the use of standardized prices. Furthermore, most IFQ fishermen have elected to use NMFS standardized prices rather than actual prices, which suggests that the standardized prices are reasonable and acceptable to industry. In 2004 (to pay for the 2003 fishing year), 95% of IFQ permit holders that paid the cost recovery fee chose to pay the fee amount that NMFS calculated they owed based on standard ex-vessel prices, while 5% of IFQ permit holders chose to pay based on the actual ex-vessel value of at least some of their landings (*Jessie Gharrett*, *pers. comm*). The successful use of standardized prices in the IFQ cost-recovery

program is likely because the program is able to use the current year's data to generate standardized prices because fees are not assessed until completion of the fishing season. By contrast, the original Research Plan was forced to base standardized prices on the prior year's data because fees were collected at the time of landing.

Therefore, to some extent, the choice of fee collection mechanism affects the choice of standardized or actual prices. The alternatives take two different approaches to fee collection. **Under Alternatives 2 and 3, which include vessels but not processors in the program, NMFS would bill vessel owners directly on an annual basis using standardized prices. Under Alternatives 4 through 7, processors would be responsible for collecting fees (based on actual prices for CVs) at the time of landing and would submit fee proceeds to NMFS on a quarterly basis.**

Standardized prices (Alternatives 2 and 3). Under Alternatives 2 and 3, NMFS would bill vessel owners directly on an annual basis using landings data and standardized prices. CP fees would be based on the round-weight equivalent of their retained products. Standardized prices were chosen for Alternatives 2 and 3 for two reasons. First, the use of standardized prices simplifies the billing process in that NMFS can apply standardized prices to each vessel's landings data to generate annual bills. Second, a fee collection system that uses an annual post-season bill would allow NMFS to use standardized prices for the same fishing year in which the fees are being assessed. A program in which fees are assessed at the time of landing would be forced to use standardized prices from the previous year as was the case under the Research Plan because standardized prices from the current fishing year would be unavailable. However, even if NMFS issues all bills using standardized prices, there is no compelling reason why CV owners could not be given the option to document and submit their fee amounts using actual rather than standardized process as is the case with the IFQ cost-recovery program. This option would be unavailable for CPs, which have no price transaction for raw fish.

Actual prices (Alternatives 4 through 7). Under Alternatives 4 through 7, actual prices would be used for CV deliveries to shoreside processors, and standardized prices would be used for CPs. Actual prices were chosen for CV deliveries to provide the opportunity to compare and contrast these two different approaches. However, the use of actual prices depends on the ability of NMFS to address the concerns expressed by NMFS during the development of the Research Plan about the use of actual prices. If these concerns cannot be adequately addressed, then standard prices may be the only viable approach for all of the alternatives.

It should be emphasized that even if a choice is made to base fees on actual prices, NMFS will still need to calculate standard prices for all landings that do not constitute the exvessel sale of whole fish to a processor. These include all landings by CPs and all transactions in which fishermen sell fish directly into the retail market such as to restaurants, groceries, and over-the-side to the public.

2.4.3 Implementing an ex-vessel value fee

While data currently collected by NMFS could be used to track the weight of raw fish offloaded to a processor, standard prices currently are not calculated for groundfish species. To calculate standard prices for other fee collection programs, regulations were adopted which required certain data collections. For example, the Council's crab rationalization program implemented a joint ADF&G and NMFS electronic reporting system which will be used to collect price information from CPs (CV fees are based on actual prices) for calculating cost recovery fees. The joint electronic reporting system would be an internet based system which will allow for near real-time reporting of catch and price information for the rationalized crab fisheries.

NMFS intends to expand the joint electronic reporting system to groundfish fisheries in the future. NMFS expects that expanding the joint electronic reporting system to the groundfish fishery would likely occur prior to implementation of any alternative restructuring the observer program which is adopted by the Council. This system would replace the current NMFS shoreside processor electronic logbook report (SPELR) and ADF&G fish ticket system and decrease the administrative burden on processors by eliminating recordkeeping and reporting redundancies (Dave Ackley, *pers. comm.)*.

The joint electronic reporting system, as it is currently envisioned for groundfish fisheries, would not require processors to enter price information for groundfish deliveries. However, NMFS would need to collect this information for any Observer Program restructuring alternative adopted by the Council which would require the collection of fees. For this reason, regulations would be proposed which would require processors to enter price information for groundfish into the joint electronic reporting system. Specifically, price reporting would be required for all processors in the GOA for Alternatives 2- 4, and all BSAI processors for Alternatives 5-7. This is because under Alternatives 2-4, CPs would be operating under a restructured observer program in the GOA, and under Alternatives 5-7, catcher/processors would be operating under the program in the BSAI. Thus, standard prices applied to CPs would be calculated from shoreside deliveries from the area closest to which they are operating. Additionally, the joint electronic reporting system could include a function which automatically calculates observer fee liabilities for those vessels which would pay fees based on actual prices. This would reduce the concerns processors had under the Research Plan in which they expected a significant increase in burden associated with calculating and collecting fees.

If NMFS is unable to implement the joint electronic reporting system for groundfish fisheries before implementing the preferred alternative for restructuring the observer program, regulations could be proposed for the joint electronic reporting system as part of this action. In addition to eliminating recordkeeping and reporting redundancies as described above, there are several advantages to the joint electronic reporting system over current processes:

- While the SPELR incorporates some reporting data used by inseason managers, it does not include the price information needed for calculating fees.
- Fish tickets are not entered into the ADF&G database in real time. Data from fish tickets are required to be submitted to ADF&G within one week of a landing and are entered by ADF&G staff into a database as they are received from processors. This process is typically considered to represent a completed data set by March or April of the following fishing year and could 1) delay the availability of funds resulting in temporary funding shortfalls if contracts are structured based short term task orders and/or reducing NMFS' ability to administer the fee program; 2) alternatively, an entire year of initial funding would be needed and the advantages of an IDIQ contract described elsewhere in this document would be minimized; or 3) force NMFS to use standard prices from the previous year.
- Fees could be calculated by hand. However, that would represent a substantial burden to the agency and potential decreases in accuracy that could result in over or under billing.
- The official fish ticket database is kept by the State of Alaska. NMFS currently has a data sharing agreement with the State of Alaska for this data. The data sharing agreement may need to be revised to incorporate the use of price information.
- The timeliness and quality of data for purposes of enforcement actions could be increased under the joint electronic reporting system.

In sum, the electronic reporting system is an efficient way of gathering data for calculating and enforcing these fees.

NMFS would use the data collections described above to calculate fees and bill vessels and processors on regular billing cycles through existing processes. The Department of Treasury maintains a website where vessels could electronically pay fees with a credit card. These funds would be electronically deposited into an account in the Federal Treasury, which would likely be established by statute. For example, legislation which established a requirement for NMFS to collect fees for quota monitoring programs also established the Limited Access System Administrative Fund (LASAF) in the U.S. Treasury. Vessels which wish to pay fees through the mail would be able to do so. NMFS would establish an account in a local bank and deposit these funds. The bank would electronically transfer these funds to the U.S. Treasury. NMFS could draw on these funds to pay contractors for providing observer services.

NMFS would implement an enforcement program to ensure fees are paid in a timely manner. At this time, NMFS expects to establish regulations which would require fee payment prior to issuance of a Federal processing or fishing permit. Currently, these permits are valid for three years. However, record keeping and reporting regulations could be altered so they are issued on an annual basis. Processors that don't pay their fees would not receive their permit and would not be able to receive groundfish during the following fishing year. Similarly, vessels that don't pay their fees would not be able to fish for groundfish during the following year. However, processors and vessels could pay a portion of their fees and receive their permit. If NMFS determines that a particular processor or vessel did not pay the correct amount, the burden would be on the vessel or processor to prove otherwise. Issuing permits annually rather than every three years would increase the administrative burden for the industry and agency. However, the benefits associated with enforceability of the fee program would likely outweigh the costs associated with the increased administrative burden.

Accounting for post-season settlements (retro-payments)

In addition to fee assessments at the time of landing, fees would be also assessed on any post-season settlements or retro-payments. Regulations implementing the program would contain reasonable deadlines for reporting post-season settlement payments and submission of fees on such payments.

Accounting for non-monetary or non-traditional marketing of fish

Some fishermen choose to market their catch directly to consumers rather than to traditional processors. And in some instances, fishermen may chose to engage in non-monetary exchange or barter of fish for goods and services. In all of these instances, fishermen would be responsible for reporting their catch to NMFS. When a traditional ex-vessel sale of fish to a processor does not occur, the fee would be assessed using standard prices.

Accounting for annual fluctuations in total revenue

One of the major problems facing the design of an ex-vessel value fee program to support observer coverage is that total revenues from the groundfish and halibut fisheries tend to fluctuate much more widely on an annual basis than do coverage needs. This issue is addressed in detail in Section 4.5.1. The program funded by the fee collection is likely to require a relatively stable budget over time with adjustments for inflation and regulatory changes to coverage requirements. However, annual revenues are likely to vary substantially due to annual changes in prices and harvests. If the program is designed to be self-funding on an annual basis, this will result in the need to increase the fee percentage during years in which the total revenue is low and decrease the fee percentage in years when the total revenue is high.

The program could resolve this problem by maintaining a surplus of funds so that a drop in revenues during any one year does not jeopardize coverage during that year. An alternative approach would be to create a more stable funding base by basing the fee on a multi-year average of total revenues. For

example, a 5-year running average could be used to estimate total revenues from fisheries subject to the fee, and the fee percentage could be adjusted automatically on an annual basis. Using this approach, the fee percentage would increase as revenues go down, and decrease as revenues go up, but the magnitude of the changes would be less dramatic in any one year. This issue will be developed further in future versions of this analysis.

2.4.4 Daily observer fee based on actual coverage costs

The most viable alternative to a fee based on ex-vessel value is a daily coverage or observer fee based on coverage costs (i.e., modified "pay-as-you-go"). This approach would to some extent mirror the existing "pay-as-you-go" program, except that vessel owners would be billed by NMFS for their coverage instead of contracting directly with an observer provider. This approach is probably only feasible for vessels and processors with 100% or greater coverage. Such a fee could be designed to exactly match the direct costs of observer coverage, as is currently the case with the pay-as-you-go program, or the fee could be set at a lower level than actual coverage costs if Federal funds are available to support the program.

Under this approach, NMFS would monitor each vessel's activity and would assess a fee based on the number of observer deployment days. The fees could be collected through direct billing by NMFS or by a third party such as a billing service. This approach is only proposed to be applied to vessels and processors in Tiers 1 and 2 (100% or greater coverage levels), and is thus only an option under Alternatives 6 and 7, which are the only alternatives that include vessels and processors in the Tier 1 and 2 category.

Advantages of a daily observer fee based on coverage levels:

- *Revenues could exactly match costs.* If the daily costs of observer coverage are known in advance (as they would be if NMFS entered into long-term contracts with observer providers) then a daily observer fee could be designed to exactly match the costs of coverage. This is a major advantage to such an approach because it means that coverage would not be threatened by revenue shortfalls.

- *Fees more closely match monitoring requirements.* An ex-vessel value fee charges everyone based on their revenues without regard to differences in monitoring requirements in different fisheries. A fee based on coverage means that everyone pays for the coverage they receive, whereas a fee based on ex-vessel value means that some vessels would subsidize coverage for others.

Disadvantages of a daily observer fee based on coverage levels

- *Does not address cost equity issues.* One disadvantage to such an approach is that it does not address the problem of disproportionate costs that is of concern in the current pay-as-you-go program and is identified in the problem statement. In effect, vessels would be charged for their observer coverage in a very similar manner to how they are charged today, except that NMFS would be assessing the fee directly.

- *Difficult to administer in fisheries with less than 100% coverage.* Another disadvantage to a daily observer fee approach is that it would be difficult to administer in fisheries with less than 100% coverage requirements. In fisheries with less than 100% coverage requirements, the daily observer fee could be assessed at a rate that matches the target coverage level for a fishery. However, such an approach would reduce the ability of managers to move coverage around to respond to changing management needs. If a daily observer fee is linked to coverage levels in a

particular fishery, then every decision by NMFS to modify coverage levels would result in fee increases or decreases and require lengthy analysis and rulemaking. This could severely restrict the ability of NMFS to modify coverage levels in a timely manner to respond to changing data needs, which is one of the primary concerns identified in the problem statement. For this reason, the daily observer fee is only proposed for vessels and processors in Tiers 1 and 2 with coverage levels of 100% or higher.

Types of fisheries that lend themselves to a daily observer fee based on coverage costs

The types of fisheries for which a daily observer fee is most appropriate are those in which 100% or greater coverage requirements are mandated by law or by the requirements of specific management programs. Typically these are fisheries in which individual vessel monitoring is required for management or enforcement purposes. For example, the AFA mandates that all AFA CPs carry two observers at all times such vessels are fishing or processing in the North Pacific. The monitoring requirements of the CDQ program and the proposed IR/IU retention requirements for BSAI non-AFA trawl CPs $\geq$ 125' also require 100% or greater coverage. In these fisheries, reducing coverage levels to respond to revenue shortfalls is not a viable option because the management programs are dependent on vessel-specific observer data to function.

Thus, a daily observer fee based on coverage costs may be the most viable approach for fisheries in which the need for individual vessel monitoring requires 100% or greater coverage levels. Such a fee would ensure that fishing operations are not affected by revenue shortfalls because the fees collected would always be adequate to pay for the required coverage. For this reason, a daily observer fee is considered as an option under Alternatives 6 and 7, those alternatives that include the major fisheries of the BSAI in the new program.

Implementing a daily observer fee

A daily observer fee would be relatively simple to administer compared to a fee based on ex-vessel value. In its simplest form, the Observer Program would submit a report to the regional office which would contain the name of each vessel required to submit daily observer fees and the number of days and observers that vessel carried during that billing cycle. This information currently is available and would likely require minimal additional programming by Observer Program staff to create a report which meets these needs. As all billing for fee programs currently is conducted by the Alaska Regional office in Juneau, staff at that office would calculate an observer fee liability for each vessel and bill each vessel on a regular billing cycle. Administrative billing and payment processes would be similar to those under the ex-vessel value option. Enforcement mechanisms for these fee payments would also be similar to those which would be in place under an ex-vessel value fee.

Daily observer fees would be estimated based on an examination of current contracts NMFS has entered into for deploying observers and estimates of costs associated with those contracts. If the daily observer fee is underestimated, NMFS may find itself in a position where observers are required on certain vessels, but does not have the funding to support that coverage. To avoid this scenario, fees could be set slightly higher than are expected and the excess could be refunded to vessels after the fishing year. Actual costs under this fee option are impossible to estimate without contracts in place.

2.4.5 Federal funds

With one exception,[8] the Federal observer programs in other regions of the U.S. are entirely Federally funded. Given this fact, many fishermen in the North Pacific believe their observer programs should also be Federally funded. Although the likelihood that Federal funds could become available to partially or fully support the groundfish observer program in the North Pacific is not easily predicted, the possibility of Federal funding is considered in this analysis. Federal funding for observer coverage can be divided into two categories: ongoing partial to full support or one-time start-up funding. Details on the need for and use of Federal funding, specifically with regard to funding initial contracts, is provided in Section 2.4.12 of the analysis. All of the alternatives under consideration can incorporate some level of Federal funding should it become available.

2.4.6 Other types of user fees that are not analyzed further

A variety of other types of user fees were considered and rejected from further analysis because they do not meet all of the principles outlined above. Most of these approaches were discussed and considered by the OAC. The following is a brief summary of alternative types of user fees and the reasons for their rejection from further analysis.

Fee based on total catch (including discards and PSC bycatch). An alternative type of fee could be based on total catch instead of landed catch so that fees are also assessed on discards and PSC bycatch. While such a fee might be appealing in that it would reward "clean" fishing and provide an additional financial incentive for vessels to avoid discards and bycatch of PSC species, such a fee would be more burdensome to monitor and collect. Discards and PSC are among the most difficult data to collect in the groundfish fisheries off Alaska and such data cannot be reliably collected on unobserved vessels because these species are not allowed to be retained. Given the relatively low levels of current coverage in most of the fisheries to which the alternatives would apply, a fee that includes discards and PSC bycatch is unlikely to be viable. That is because NMFS would have no basis upon which to assess the fee against vessels that did not carry observers. Such a fee would require burdensome and costly additional monitoring of bycatch and discards to collect the necessary data.

Fixed tonnage fee by species or product. This type of fee is currently used in the BSAI inshore pollock fishery where vessels pay a fee of 0.6 cents per lb for all pollock landed in the directed pollock fishery. A similar type of fee in the form of a fixed tonnage fee for each type of groundfish and halibut harvested under the restructured observer program could also be used to support observer coverage. However, the application of a fixed poundage fee would be more complicated in a multi-species fishery. To establish such a fee, the Council would likely need to consider a separate fee amount for each species so that high-value/low-volume fisheries are treated comparably with high-volume/low-value fisheries. Otherwise, some fishermen would be paying disproportionately high fees relative to their revenues, and participation in some low-value fisheries could be effectively precluded if the fee is too high a percentage of the ex-vessel value. Setting a separate tonnage fee amount for each species and/or product type could result in a long, complicated and political process that can be avoided by using a uniform fee based on ex-vessel value. An additional disadvantage to such a fee is that it does not account for inflation. Fee revenues would remain constant over time (relative to the TACs) while observer costs could increase. A fee based on a percentage of ex-vessel value has the potential to increase revenues over time to the extent that prices increase due to inflation. However, fish prices and observer costs are not necessarily linked and in any one year prices could drop while observer costs increase. Over the long-term, a fee that is based on ex-vessel value is more likely to follow inflation than one that does not change over time.

[8] The Pacific hake observer program in the Northwest is funded by industry in the same manner as the North Pacific groundfish observer program.

Licensing fee. Federal fishing permits are currently issued free of charge by NMFS to all eligible applicants. A licensing fee similar to existing car-tab fees could be assessed on vessels that wish to participate in a fishery governed by the program. Licensing fees could be based on factors such as vessel length, gear type, target fishery, or even the vessel's appraised value. However, such fee would be difficult to develop in a manner that is fair and equitable and does not impose a disproportionate cost on certain participants. It could also require substantial additional paperwork and recordkeeping.

Export/import tax on seafood products. Import/export duties could be imposed on seafood products to support management programs such as observer coverage. Such a fee would shift some of the costs of coverage to foreign seafood producers and/or foreign consumers. However, this type of program falls outside of NMFS' jurisdiction and is not analyzed further in this document. Furthermore, this type of tax would be more appropriate to consider at the national level to support observer programs nationwide.

Fuel tax. Fuel taxes have been used to support various conservation and management programs. A tax on marine fuel could be imposed to support marine resource management needs such as observer coverage. However, as with the import/export tax, a fuel tax falls far outside of NMFS' jurisdiction and would be more appropriate to consider at the national level to support marine resource management needs nationwide. For this reason, it is not considered further in this document.

2.4.7 Fee collection: Who is responsible for collecting the fee?

A major issue with the previous Research Plan was the requirement that processors collect and submit vessel fees. Processors were concerned about the administrative burden associated with collecting and submitting fees. With advances in electronic reporting, fee tracking and submission could be largely automated. Therefore, the administrative burden associated with fee collection and submission is likely to be much less than what they were under the original Research Plan. On the other hand, the IFQ fee collection program is based on direct billing of fishermen and has proven that such a system is viable, at least in the context of IFQ fisheries where individual quotas may be withheld for lack of payment.

Annual post-season billing by NMFS (Alternatives 2 and 3). Under Alternatives 2 and 3, which do not include processors in the program, NMFS would follow the IFQ cost-recovery program model under which NMFS would bill vessel owners directly on an annual basis. This approach would require NMFS to develop effective enforcement mechanisms to address the potential problem of non-payment. One way to do so would be to withhold the renewal of fishing permits until observer fees from the previous year are paid.

Processor collection at the time of landing (Alternatives 4- 7). Under Alternatives 4 through 7, processors would be responsible for collecting fees from fishermen at the time of landing, and for submitting fee proceeds on a quarterly basis. This approach would be facilitated through modifications to existing software. Software automation should address the concerns expressed by industry about the paperwork burdens of fee collection during the development of the original Research Plan. An electronic reporting system is described above and would support this process.

2.4.8 Uniform or variable fees?

Coverage needs among fisheries are not uniform and may vary in response to factors such as species composition, bycatch levels, marine mammal and endangered species interactions, and the level of individual vessel monitoring in the fishery. The decision to use uniform or variable fees addresses the equity-related question of whether all fishermen should pay a uniform ex-vessel fee regardless of the coverage needs in their particular fishery, or whether fishermen who participate in fisheries with higher coverage needs should pay a proportionately higher fee. One of the problems identified with the current "pay-as-you-go" system is that coverage levels are inflexible and difficult or impossible to adjust based on management needs. An important advantage of the proposed restructuring is increased flexibility in determining how observers should be deployed among fisheries. For that reason, establishing a program in which fees are directly linked to target coverage levels in individual fisheries may be inadvisable. If every change in target coverage level for a particular fishery also resulted in a change in the fee percentage, then every change in target coverage levels would become a politically-charged decision that could require lengthy Council action and agency rulemaking. Such a system would greatly restrict the ability of managers to vary coverage levels in response to changing management needs.

For this reason, none of the alternatives consider options that would establish variable fees for "baseline" coverage based on categories such as target fishery and gear type.

2.4.9 Supplemental fee options for special programs

All of the alternatives in this analysis assume that a uniform fee would be established for all participants in the program. The choice of a uniform fee is based on the assumption that all of the Tier 3 and Tier 4 fisheries covered by the program would continue to be managed under the current management system which relies on aggregate data to manage TACs rather than individual vessel-specific data. However, the passage and implementation of GOA rationalization could significantly change the data collection and monitoring requirements for those fisheries covered by the rationalization program. Monitoring and enforcement alternatives have yet to be developed for GOA rationalization, however the rationalization alternatives currently under consideration could require increased observer coverage. In addition, other rationalization proposals currently under development, such as the cooperatives under consideration for non-AFA BSAI CPs, also propose significant increases in observer coverage to that fleet (200%).

Given the variety of new rationalization programs currently under development, the Council may wish to consider whether it is more equitable to fund the increases in observer coverage required by new rationalization programs through some form of supplemental fees that are assessed only on the participants that benefit from such rationalization programs. Most of the GOA rationalization alternatives under consideration contain options for individual halibut PSC quotas at the individual vessel or cooperative level. These programs would likely require increases in observer coverage to generate adequate catch and bycatch data at the individual vessel or cooperative level.

Supplemental fee revenues could be generated by increasing the ex-vessel fee percentage for participants in rationalization programs, or could be generated through any of the other types of fees described above. Alternatively, IFQ cost recovery fees could be used, in part, to cover increased observer costs required for a new groundfish IFQ program, although the effect would be to raise the ex-vessel value fee for IFQ holders because the MSA specifies that IFQ cost-recovery fees be expressed as a percentage of ex-vessel value. **Note that any change or addition to the current fee would have to be approved through subsequent analysis and rulemaking.**

A supplemental fee program is not included as a component in any of the alternatives in this analysis. The only rationalization programs on the near-term horizon that will significantly increase observer coverage requirements are the IR/IU-related Amendments 79 and 80 to the BSAI FMP, which would increase coverage requirements on non-AFA trawl CPs to 200%. However, if Amendment 80 is approved and implemented by NMFS, the likely effect would be to shift these fisheries to the Tier 1 category where they would be subject to a daily observer fee rather than an ex-vessel value fee, eliminating the equity issue (see Table 2.3-1). Nevertheless, the Council may wish to consider supplemental fee programs in the future, should they be needed to address additional management needs in specific fisheries that are subject to an ex-vessel value fee. This may be as simple as ensuring that the FMP text, regulations, and any statutory language authorizing the program are sufficiently flexible to support the later adoption of a supplemental fee program. While the Council and NMFS have the ability to modify FMP amendments and regulations, once a statutory change is enacted, it is much more difficult to modify. Therefore, it is crucial that any statutory language establishing a new Observer Program be sufficiently flexible to accommodate future management needs.

2.4.10 Initial fee percentage

Regardless of the alternative chosen, setting an initial fee percentage is an important decision for the Council. However, it is not possible to recommend specific fee percentages at this stage in the analysis because both future coverage needs and the level of direct Federal funding are unknown. Nevertheless, the fee percentage (and the level of Federal funding) would determine the program's budget and would directly affect coverage levels in the fisheries covered by the program and costs paid by industry. The issue of how much coverage is necessary or optimal to manage particular groundfish and halibut fisheries is complex and goes beyond the scope of this analysis. The process for determining the annual coverage levels in fisheries that are determined to need less than 100% coverage (Tier 3 and 4) is discussed in Section 4.3.2.

Most of the fisheries in question are currently evolving, as a rationalization program is under development for the GOA groundfish fishery and various bycatch management cooperative proposals are under development for the BSAI groundfish fisheries, and future coverage needs are unknown. It is also beyond the scope of this analysis to determine what levels of coverage would ultimately be necessary to implement the various rationalization and bycatch management proposals that are currently under development. **For this reason, this analysis is limited to considering the fee percentages necessary to maintain existing levels of coverage overall (with the flexibility to shift coverage among the Tier 3 and 4 fisheries as necessary) and provide some resources to expand the program into fisheries that currently have no coverage (the halibut and under 60' groundfish fleets) in the absence of any direct Federal funding.** To the extent that Federal funding becomes available, fee percentages could be reduced or coverage increased. Therefore, three fee levels (upper, middle, and lower endpoints) are proposed for Council consideration under each alternative in the RIR.

Option 1: Maintain the existing number of deployment days (lower endpoint). Under this option, the fee percentage would be set at the level necessary to provide an equivalent number of coverage days that are currently provided under the status quo. NMFS would have roughly the same number of observers to work with as are available under the status quo, but would have the flexibility to deploy these observers in a more rational fashion to maximize the utility of the data collected. Under this option, any deployment of observers in the halibut fishery and on groundfish vessels under 60' would come at the expense of existing coverage levels on shoreside processors and groundfish vessels $\geq$60'. Under all of the alternatives, the average costs of observer coverage for vessels that currently carry observers would go down under this endpoint because the status quo number of coverage days would be supported by revenues from a wider fleet than under the status quo.

Option 2: Establish a fee percentage that accommodates 100% coverage for trawl and longline CPs <125' while maintaining the existing number of observer days for the remaining fleets covered by the program (mid-point). Under this option, all trawl and longline CPs *<125'* would be assigned to Tier 2, and fees would be increased relative to Option 1 to accommodate this increase in coverage without affecting coverage levels in other fisheries.

Option 3: Establish a fee percentage that is self-supporting at current coverage levels for sectors that currently have coverage and apply the same fee percentage to all new fisheries into which the program expands (upper endpoint). Under this option, the fee percentage would be set at a level necessary for fee revenues from the currently covered sectors of the industry (groundfish vessels over 60' and shoreside processors) to fund the current number of deployment days in those sectors. Each new sector that is not currently covered that comes into the program will generate additional fee revenues so that expansion of coverage into the under 60' groundfish and halibut fleets would not necessarily come at the expense of existing coverage for vessels over 60'. Because the average daily revenues generated by halibut vessels and groundfish vessels under 60' are lower than the average daily revenues generated by groundfish vessels over 60', and because observer costs per deployment day are generally higher for small vessels that operate out of more remote ports, fee revenues generated by halibut vessels and groundfish vessels under 60' would not be adequate to extend coverage to those vessels at levels currently in effect for groundfish vessels over 60'. A precise estimate of the level of coverage that the upper endpoint fee would provide for halibut and groundfish vessels under 60' will be difficult to make because data on the average number of fishing days for such vessels is unavailable.

2.4.11 Process for adjusting fee percentages

While the Council and NMFS can set an initial fee percentage that is likely to be sufficient to maintain current coverage levels and allow expansion of the program into new fisheries, some mechanism must be established through which the fee percentage can be adjusted to account for changing needs as well as changing coverage costs and ex-vessel prices. The original Research Plan created a framework process under which fee percentages could be adjusted on an annual basis (within the 2% statutory limit) in response to changing needs for observer coverage. However, recent legal guidance on frameworking suggests that an open framework of this sort may no longer be acceptable under the requirements of the Administrative Procedure Act, should the framework mechanism provide NMFS and the Council with the ability to make discretionary changes to the fee percentage. Such discretionary changes to fee percentages need to go through the process of notice and comment rulemaking. Additional legal guidance has been requested to determine if any options exist for discretionary fee adjustments that do not require rulemaking.[9]

The IFQ cost recovery program does provide a mechanism through which the IFQ fee is adjusted on an annual basis. However, the formula for establishing the fee percentage is specified in regulation and neither NMFS nor the Council may make discretionary changes to the IFQ fee percentage that fall outside this formula. Regulations at 50 CFR 679.45(d)(2) state that the "annual fee percentage" is the percentage, rounded to the nearest tenth of a percent, of the "total ex-vessel value" of the IFQ fisheries that must be collected to recover allowable costs, with the percentage not to exceed 3%. IFQ regulations specify that the fee percentage be calculated using the following formula:

[100 x (DPC - AB) / V] / (1 - NPR)

where:

[9]Letter from Chris Oliver to Lisa Lindeman, December 29, 2004.

DPC - is the direct program cost for the IFQ fishery for the previous fiscal year;

AB - is the projected end of the year account balance for the IFQ program. This balance is zero the first program year and would be a positive amount in any subsequent year for which an over-collection of fees occurs. Slight over- collection of fees can occur, for example, if the amount collected exceeds costs due to amendments to landings data after the fee percentage is calculated; or if some permit holders pay fees based on actual value received which is greater than the value of their landings based on the "standard ex-vessel values". Any over-collection amounts are incorporated in the fee percentage calculation the following year.

V - is the projected ex-vessel value of the IFQ fishing subject to the IFQ fee for the current year ("total ex-vessel value"); and

NPR - is the "non-payment rate", the fraction of the fee assessment that is expected to result in nonpayment. The first year this program's expectation of non-payment was zero. In subsequent years, this figure is the fraction of the principal amount billed that is not collectible by NMFS and which is referred for collection.

IFQ regulations specify that the "default" fee percentage is 3% of "the total ex-vessel value" of IFQ fish landed each year. If applying a 3% fee would recover revenues in excess of those needed, the percentage is set at less than 3%. When the fee is set at less than three percent, notice of the new percentage is published in the Federal Register and reflected in summaries sent to permit holders. Once the annual fee percentage is published, it is not changed.

Because this formula is explicit and adhered to rigidly each year, NMFS may adjust the IFQ fee percentage on an annual basis through a *Federal Register* notice without the need for notice and comment rulemaking. However, the Council and NMFS do not have the discretion to establish an IFQ fee percentage different from that generated by this formula without going through the process of an FMP amendment and notice and comment rulemaking.

The Council and NMFS could potentially use the IFQ cost-recovery program approach to provide annual adjustments to the fee percentage if the formula is explicit. However, a rigid framework formula for adjusting fee percentages would eliminate any possibility for the Council and NMFS to make discretionary changes to the fee percentage based on changing management needs. **Therefore, a formal regulatory amendment is assumed to be required for any change in the fee percentage.** Nevertheless, regardless of whether a framework or formal rulemaking is required for adjustments to the fee percentage, this analysis assumes that both the Council and NMFS would be involved in the decision to change the fee percentage in response to changing costs and coverage needs.

2.4.12 Start-up funding and Federal funds

Start-up funding is crucial to the successful implementation of a restructured observer program. Without start-up funding, fees would need to be collected in advance of the start-up date until sufficient fees are collected through the program to make it self-supporting. It may not be economically viable to collect fees from vessels that are still paying for observers through the current pay-as-you-go system. Consequently, some type of start-up funding is necessary so that funds are available for observer contracting during the first year of the program, although the amount of start-up funding required depends on both the program scope and the type of contracting model chosen. Direct Federal funding during the first year of the program would be one way to achieve start-up funding. An alternative source of start-up funds could be a Federal loan similar to the one established under the AFA for the inshore pollock fishery in the BSAI. Under the AFA, the inshore sector was "loaned" $75 million for the purpose of retiring nine

CPs and transferring their catch history to the inshore sector. This loan is currently being paid off over a 20-year period through a 0.6 cent/lb fee on inshore pollock landings. A similar type of loan could be used to obtain start-up funds for a new observer program. An alternative approach would be to generate startup funds by beginning fee collection from vessels that are not currently required to carry observers in advance of the implementation date.

One type of contract called "Indefinite Quantity/Indefinite Delivery (IQ/ID) would reduce, but not eliminate, the need for start-up funds. Under IQ/ID contracting, NMFS would enter into an agreement with one or more service providers for a certain minimal number of observer days or time period with the option to continually extend the contracts as funds become available and/or the contractor continues to meet the terms of the contract. Under IQ/ID contracting, NMFS could enter into coverage contracts sufficient for the first quarter of coverage in a given year and then continue to renew or extend those contracts as fee proceeds become available. The amount of start-up funds required under IQ/ID contracts would depend on the specific terms of the contract. Additional information on this type of contracting process is contained in section 4.9.1.

It should be noted that both a Federal grant and a loan would require Congressional authorization. Furthermore, the choice of alternative (in terms of program scope) will directly affect the level of funding necessary to implement the program in the first year. Any future decision to expand the scope of the program at a later date would also generate a parallel need for additional subsidies to fund program expansion.

Ongoing Federal funding

In addition to start-up funding, some level of ongoing Federal funding is clearly desired by industry to reduce fee percentages and bring the program into alignment with the majority of other observer programs throughout the nation that receive full Federal funding. However, it is not possible to speculate as to the likelihood and level of any future Federal funding to cover the direct expense of observer coverage.

2.4.13 Restrictions on the use of fee proceeds

Under all of the alternatives, it is assumed that NMFS would continue to be responsible for administrative costs, and that fee proceeds would not be used to cover expenses related to the administration of the Observer Program.

In addition, under the original Research Plan, fee proceeds could only be used to pay for costs directly associated with coverage by human observers. However, advances in technology may produce viable alternatives to human observers in some instances. Furthermore, additional technologies and equipment could be required onboard vessels to assist observers in their data collection. Proceeds of the fee program could be restricted to funding only human observers. Alternatively, the program could be designed so that some fee proceeds could be used to subsidize or pay for supplemental or alternative monitoring technologies that could be required on some vessels. A separate analysis of alternative monitoring technologies and their potential applicability to the GOA and BSAI fisheries has been prepared under contract, and is provided as Appendix I to this document. The Council may wish to consider the results of that analysis to determine how the use of fee proceeds should be restricted.

2.5 Technological and equipment requirements

NMFS has already established various technological and equipment requirements for vessels required to carry observers under the existing regulations. These include requirements for sampling stations on

certain CPs and inshore processors, and the communication software requirement so that observers are able to submit data from sea. These requirements would be largely unchanged under the proposed alternatives.

Table 2.5-1 Existing and proposed equipment requirements under the new tier structure.

Equipment requirement	*Applicability*
Flow scales (or equivalent)	Tier 1
Observer sampling station	Tiers 1 and 2
ATLAS communication software and equipment	Tiers 1 through 3
Check-in/Check-out system (manual or automated)	Tiers 1 through 3 and Tier 4 when necessary
Electronic fishing logbook (proposed as a voluntary measure)	Tiers 1 through 4

2.5.1 Electronic fishing logbook

Under all of the alternatives, some type of data collection system is necessary to track the fishing activity of observed and unobserved vessels in order to inform decisions about when and where to deploy observers. This is exclusively an issue in Tier 3 and 4 fisheries with less than 100% coverage, because in Tier 1 and 2 fisheries with 100% and greater coverage, the deployment decisions are automatic. (The vessel does not operate without one or two observers.) The existing catch accounting system may be adequate for administering general coverage models. However, more sophisticated coverage models that are designed to respond to changing fishing patterns will require more precise and timely tracking of fishing activity than is provided by landing reports. The most viable method of tracking fishing activity in a more precise and timely manner would be the use of electronic fishing logbooks that are integrated with GPS or VMS technology.

Logbook record keeping and reporting are required for fishing vessels $\geq$60' to participate in the BSAI and GOA groundfish fisheries. Software has been developed to allow fishermen to record and submit data electronically. The NMFS Alaska Regional Office has developed software to accept the electronic logbook data. Shoreside and stationary floating processors which receive deliveries from CVs participating in a directed pollock fishery must use an electronic logbook and other shoreside or stationary floating processors may choose to use an electronic logbook in lieu of a paper logbook. Additionally, NMFS has approved the use of the electronic logbook system as an alternative to paper logbooks for all CVs. Electronic logbooks are expected to be an efficient method to provide improved access to more accurate and complete information for fisheries research and management. In addition, electronic logbooks store data in a format that allows vessel operators to use the data more easily and more productively to monitor and improve fishing operations.

Note that while NMFS recognizes the benefits of using electronic logbooks to assist NMFS in deploying observers, none of the alternatives under consideration in this analysis contain a requirement that vessels obtain and use electronic logbooks.

Pilot project to test electronic logbooks in Alaska groundfish fisheries

Through a cooperative agreement with PSMFC, the Alaska Fisheries Science Center (AFSC) initiated a pilot project to facilitate the use of electronic logbooks by trawl CVs in the BSAI and GOA groundfish fisheries. Under the pilot project, NMFS provided electronic logbook software, developed by OceanLogic, free of charge to 50 trawl vessels. During the first quarter of 2003, OceanLogic installed the software on 31 trawl vessels that participate in the pollock and Pacific cod fisheries. The electronic logbook system is being used on 11 of the 31 trawl vessels to record and report required logbook data to NMFS. For many of the other 20 trawlers on which the software has been installed, the software is being used experimentally to record data but not for submission to NMFS. The plan is to have the software installed on an additional 19 trawlers in the near future, to encourage its use on the 50 trawlers which will have received the software under this pilot project, and to ask vessel operators to submit voluntarily the frequent time and location data that are automatically recorded by the electronic logbook system on the vessels. In a cooperative effort among fishermen, OceanLogic, and the AFSC, the software will be enhanced to allow fishermen to record additional data that will be of use to fishermen and NMFS in monitoring economic performance.

There has been a lively discussion among fishermen about the pros and cons of using the electronic logbook system to both record and report logbook data. One year later, only seven fishermen continue to use the software. Based on personal discussions with GOA trawl fishermen that do not fish AFA pollock, only two skippers are happy with the electronic logbook.[10] This experience suggests that additional work on the system is necessary before requiring vessels to use it on a widespread scale. However, electronic logbooks have experienced widespread success in other regions of the world, indicating that the technology is mature enough to be successfully implemented.

Compared to the hard copy logbooks currently used, electronic logbooks are expected to have several critical advantages with respect to providing data for fishermen, fishery research, and management.

1. A vessel's data will be easier for the vessel operator to access and use because it will be in an electronic format that can be used by a variety of existing and planned software packages.

2. More timely data will be available to NMFS managers and scientists because the data will be submitted more frequently and quickly and entered automatically into a database shortly after being received. With hard copy logbooks, vessel operators are required to submit copies of their logbook data to NMFS within 1 month of the end of each quarter; therefore, timely data are not available even in a hard copy format.

3. Data entry errors that occur after NMFS receives the data will be reduced because the data entered by the vessel operator and the vessel's electronic logbook system will feed directly into the agency's logbook database.

4. The quality of the data submitted to NMFS will improve. First, the time and location for each haul set and retrieval is entered automatically using data from the vessel's GPS system. The vessel operator pushes a button at the beginning and end of each haul. Second, the software that has been developed by NMFS to receive the electronic logbook data checks for errors; and, if errors are found, they are flagged and sent to the vessel operator who submitted the data.

5. The electronic logbook system can provide more information than is available from the hard copy logbooks. The data recording software that has been developed by OceanLogic automatically and

[10] Alan Kinsolving, NMFS Alaska Region, personal communication.

frequently collects vessel location information during each tow. The logbook data currently includes just the set and retrieval locations, not frequent vessel location data.

Other examples of electronic logbook requirements

Electronic fishing logbook requirements have been developed in other fisheries around the world. Perhaps the most extensive use of electronic fishing logbooks outside the U.S. has been in Australia, where the Australian Fisheries Management Authority (AFMA) has developed an electronic fishing logbook for various Australian fisheries. In the Australian example, AFMA does not involve itself in the development of electronic fishing logbook software, nor does it specify what software fishermen are required to use. Instead, AFMA has developed a set of specifications, including standard formats for logbook data and transmission that are available for all software venders. AFMA has procedures for testing the receipt of logbook data from different software venders and certifies those software packages that meet its established standards. Fishermen are free to use any electronic logbook system that meets AFMA standards (AFMA 2004).

Ideal elements of an electronic fishing logbook for North Pacific groundfish and halibut

Because computer and communications technology is advancing at a rapid pace, the software and hardware used in existing fishing logbooks is likely to be obsolete before a new observer program is implemented. Therefore, rather than point to existing products that may meet some objectives, it may be useful to consider some ideal characteristics of a electronic fishing logbook system for the North Pacific. These include:

- Automatic integration with GPS so that time and position information is automatically stored by the logbook and fishermen do not need to manually enter fishing locations.
- Automated entries for frequently used information so that manual entries can be minimized
- Two-way communications so that logbook entries can be transmitted to NMFS electronically on a real-time basis and NMFS has the ability to communicate back to the vessel. This type of system could be used by NMFS to determine on which vessels to deploy observers, and to communicate to the vessel that they will be receiving an observer for the next fishing trip.
- Use on multiple platforms. Most larger vessels have onboard PCs on which electronic fishing logbooks could be installed. However some of the smallest groundfish and halibut vessels may not have space on board in which to install a permanent computer workstation. In these circumstances, it may be useful to consider alternative technologies such as ruggedized handheld computers that could be easily carried on board the smallest vessels.

2.5.2 Check-in/check-out system for vessels and processors.

Some type of system will be necessary so that vessels and processors can provide managers with advance notice of their fishing or processing plans. Such a system will be necessary for all fisheries that receive coverage from the program. A check-in/check-out system could potentially be integrated with the electronic fishing logbook system, or could be a separate stand-alone system. A check-in/check-out system could be administered manually by NMFS (or contract employees) who would answer telephones and receiving faxes and enter the data by hand, or could be a fully-automated telephone or internet-based program. Many aspects of the development and administration of a check-in/check-out system could be implemented through private contracting. This element of the program is discussed in Section 4.3 and can be further developed by NMFS during the implementation phase once a preferred alternative is selected.

2.5.3 Additional equipment and technologies not currently under consideration

Several alternatives to human observers have been tested in various fisheries. The use of video cameras to monitor at-sea fishing activity is a relatively new technique, and has only been tried in limited fisheries to date. The approach involves mounting tamper-proof video cameras in various locations on the fishing deck and recording all or a portion of the vessel's fishing activity. A recently completed pilot program in the Alaska halibut fishery has found video cameras to be extremely useful in monitoring seabird bycatch and compliance with seabird avoidance measures. However, video monitoring alone is unlikely to provide an adequate method to monitor groundfish catches and PSC bycatch.

Digital observer technology takes the use of video monitoring one step farther. This technology uses a digital scanner to record multiple images of individual fish for electronic species identification and for length frequency estimates as each fish passes through the scanner on a conveyer belt. The primary developer of this technology is Digital Observer LLC of Kodiak, Alaska. Although this technology is still in the testing phase, it may be a viable alternative to human observers for collection of limited types of data on certain types of vessels and fisheries. However, all indications are that the technology is not advanced enough to replace observers, especially for tasks such as species composition sampling and collection of biological samples.

To the extent that these technologies show promise, they could be included in monitoring programs for specific future management proposals. However, their application is too specialized and fishery-specific to consider for inclusion in this more general FMP amendment package. The Council contracted for the preparation of a separate analysis to evaluate alternative monitoring technologies and their potential applicability to the GOA and BSAI groundfish and halibut fisheries. This analysis is included in the appendix.

Under the original Research Plan, fee proceeds could only be used to pay for costs directly associated with coverage by human observers. However, advances in technology may produce viable alternatives to human observers in some instances. In addition, additional technologies and equipment could be required onboard vessels to assist observers in their data collection. Proceeds of the fee program could be restricted to funding only human observers. Alternatively, the program could be designed so that some fee proceeds could be used to subsidize or pay for supplemental or alterative monitoring technologies that could be required on some vessels.

2.5.4 Contracting process and the role of observer providers

Under all of the alternatives under consideration, private contractors would continue to be the source of observers deployed under the restructured program. The main difference from the status quo is that NMFS would be the entity responsible for contracting for observer coverage rather than the vessel owner. Complicated regulations and procedures already govern the Federal contracting process. Therefore, this analysis does not examine alternatives to the process that would govern direct Federal contracting for observer services. The existing Federal contracting process is described in Section 4.9 to provide the Council and the public with an understanding of how the program would operate, should one of the action alternatives be adopted. This section also explores the role of contractors under a new program, and whether single or multiple contracts, and single or multiple contractors, are preferable.

Several different contract modules are possible but are difficult to develop until the scope of work is defined. In essence, there are several ways to accomplish any task and distribute work. Contracting is flexible and will accommodate various desired scenarios. For example, the work can be broken into components regionally (BSAI or GOA), by gear type, or by vessel size class. Various combinations are possible. It is also possible to develop different types of work modules. One module could be for overall

coverage planning and another for the provision of observers to obtain that coverage. Once the scope of work and funding are identified, NMFS can further develop alternative contract modules for consideration. Details are provided in Section 4.9.

2.6 Detailed summary of the alternatives

The various program elements and options described in previous sections could be combined into thousands of possible combinations, thus the analysis is unable to explore every possible combination of program elements. Therefore, six representative action alternatives have been identified in addition to the no action alternative, and are arranged in order from the smallest to the largest in terms of scope. The Council could select one of these representative alternatives as its preferred alternative, or combine various program elements and options into an 8th and preferred alternative prior to final action. The following table provides a detailed summary and comparison of the seven alternatives.

Table 2.6-1 Comparison of the seven alternatives.

Program Elements	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4*	*Alternative 5*	*Alternative 6*	*Alternative 7*
***Program Scope** GOA*							
groundfish vessels <60'	no	yes	yes	yes	yes	yes	yes
groundfish vessels ≥60'	no	yes	yes	yes	yes	yes	yes
halibut vessels	no	no	yes	yes	yes	yes	yes
GOA-based groundfish processors	no	no	no	yes	yes, with option to exclude	yes, with option to exclude	yes
Program Scope BSAI							
BSAI fixed gear CVs; all pot vessels	no	no	no	no	yes	yes	yes
halibut vessels	no	no	yes	yes	yes	yes	yes
All BSAI groundfish vessels <125'	no	no	no	no	no (only fixed gear)	yes	yes
Longline CPs ▲125'	no	no	no	no	no	option to include	yes
Non-AFA trawl CPs ▲125'	no	no	no	no	no	option to include	yes
BSAI-based groundfish processors that take GOA groundfish deliveries	no	no	no	Processor may opt-in or opt-out but must pay fee on program-covered landings regardless	Processor may opt-in or opt-out but must pay fee on program-covered landings regardless	Processor may opt-in or opt-out but must pay fee on program-covered landings regardless	yes
BSAI-based processors that take deliveries of BSAI groundfish from vessels covered by the program	no	no	no	no	Processor may opt-in or opt-out but must pay fee on program-covered landings regardless	Processor may opt-in or opt-out but must pay fee on program-covered landings regardless	yes
Coverage levels	0%, 30% and 100% coverage levels established in regulation	Vessels and processors assigned into one of four tiers depending on management criteria in each fishery. In Tiers 1 and 2, 200% or 100% coverage would be mandatory. In Tiers 3 and 4, coverage levels would be determined by NMFS on an ongoing basis to maximize the utility of observer data and deploy observers in the most effective manner. Vessel operators would not be required to achieve a certain coverage level, but instead would be required to carry an observer when one is provided by NMFS.					
Type of fee	Vessel contracts directly for coverage	Percentage of ex-vessel value of landed catch				Tier 1 and Tier 2 fisheries would be assessed a daily observer fee with an option for ex-vessel value fee. Tier 3 and Tier 4 fisheries would be assessed an ex-vessel value fee	

Program Elements	*Alternative 1*	*Alternative 2*	*Alternative 3*	*Alternative 4*	*Alternative 5*	*Alternative 6*	*Alternative 7*
Fee collection	Vessel billed directly by provider for actual coverage	Direct annual billing by NMFS		Vessel fees would be collected by processors at the time of landing with proceeds submitted to NMFS quarterly.			
Basis of ex-vessel price	N/A	NMFS would bill using standardized prices. CV owners could have the option of using actual prices for some or all landings.		Processors would collect fees based on actual prices at the time of landing and at the time of any subsequent price adjustments. CPs would pay based on standardized prices using round-weight equivalents.			
Basis of daily observer fee	N/A	N/A				Average daily cost of coverage as determined by current service delivery contracts.	
Fee percentage	N/A	Uniform "baseline" fee for all participants established in regulation					
Supplemental funding	N/A	Supplemental fees or IFQ cost recovery fees could be used to support increased coverage for fishery-specific rationalization programs					
Initial fee percentage	N/A	Low or high endpoint options based on the status quo observer costs and coverage levels					
Process for adjusting fee percentages	N/A	Notice and comment rulemaking					
Contracting process	Vessel contracts directly with provider for coverage	NMFS contracts with one or more observer providers to obtain coverage for the vessel and processor sectors included in each alternative. Vessels and processors not included under the alternative continue to contract directly with observer providers for coverage.					
Initial coverage levels for Tier 3 and 4 fisheries	Established in regulation	To be determined later based on separate, analysis. Individual vessel operators would not be responsible for achieving mandatory minimum coverage levels but would only be required to carry an observer when one is provided and when requested to do so by NMFS. The coverage levels for vessels and processors participating in fisheries with mandatory coverage requirements of 100% or greater would not change (e.g., AFA and CPs fishing CDQ).					
Start-up funding	none	Federal appropriations (grant or loan)					
Direct Federal funding	none	Federal appropriations to supplement or replace fee revenues					
Electronic fishing logbooks	N/A	Voluntary use of electronic logbooks encouraged by NMFS through financial incentives if available					
Inseason deployment	Determined by vessel and observer provider	Determined by NMFS based on inseason or annualcoverage priorities.					
Restrictions on the use of fee proceeds	N/A	Option for using fee proceeds to pay for electronic monitoring technologies. Potential application of technological monitoring is subject of Appendix I.					
Expiration date	December 31, 2007	No expiration date for new program. There is also an option to remove the expiration date for the existing pay-as-you-go program, should any subset of vessels/processors remain in that program. Without an expiration date, program(s) will be permanent until subsequent rulemaking is approved.					

2.7 Alternatives rejected from further analysis

Observers as Federal employees. While NMFS maintains a small cadre of observer staff who are Federal employees,[11] their role is to solve specific sampling problems on individual vessels and improve communication among NMFS, observers, and industry. The intent of the cadre is not to take the place of the observer. An alternative to eliminate the role of observer providers and convert all observers to Federal employees is not analyzed in this document for several reasons. First, it is extremely unlikely that such a program would be approved by the Secretary because it is inconsistent with current Federal polices that restrict Federal hiring and emphasize the role of Federal contractors. Second, observer providers are very experienced at the logistics of observer deployment and that expertise would be lost. Third, contractors have far greater flexibility to hire short-term seasonal employees such as observers, than does the Federal government. For these reasons, the option to convert all observers to Federal employees was discussed and considered in several OAC meetings, and was determined not to be a viable alternative to the use of observer providers.

Joint Partnership Agreement (JPA). NMFS and the Council attempted in the late 1990s to develop a third-party JPA. This effort failed due to legal obstacles as described in Section 1.1.2.

2.8 Related NEPA and fishery description documents

The following list of NEPA documents have addressed the groundfish fisheries of the BSAI and GOA in general, and the North Pacific Groundfish Observer Program in specific. This analysis relies on much of the work contained within these existing documents.

Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS). A PSEIS was prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs against policy level alternatives. A draft PSEIS was circulated for public review and comment from January 25 through July 25, 2001. Revision of that analysis and publication of a second public review draft was distributed in September of 2003 (NMFS 2003). The final PSEIS was provided by NMFS in May 2004, and the public comment period ended July 3, 2004 (NMFS 2004).

TAC-Setting EIS. The original EISs for the BSAI and GOA FMPs were completed in 1981 and 1979 respectively. The TAC setting process was not revisited in an EIS until 1998, when an SEIS on the process of TAC setting was completed (NMFS 1998a). In that document, the impacts of groundfish fishing over a range of TAC levels were analyzed. The five alternatives were very similar to current TAC levels. Setting the TAC under the status quo procedures was found not to have significant impacts on the issues evaluated.

Annual TAC-Specifications EAs. In addition to the TAC-setting EIS analysis, environmental assessments have been written to accompany each new year's TAC specifications since 1991. One exception was the 2001 harvest specifications which were promulgated by emergency rule published in January 2001 without an accompanying analysis. That was done because the TAC specifications were set by Congressional action at the 2000 levels (Public Law 106-554). An EA was prepared on the 2001 TAC specifications in July 2001. The 2002 TAC specifications were also promulgated by emergency rule, however, an EA was completed and FONSI determination made prior to publication of the rule. The final rules for the GOA and BSAI 2005 and 2006 harvest specifications are effective February 24, 2005 through December 31, 2006.

[11]The cadre is comprised of 6 Federal full-time employees (FTEs).

American Fisheries Act EIS. The AFA was signed into law in October of 1998. Implementation of the AFA required major provisions to the regulations and in April of 2000, a notice of intent to prepare an EIS was published in the Federal Register. A draft EIS was published in October 2001 and a final EIS was published in February 2002.

Extending the Interim Observer Program Beyond 2002. The Council adopted and NMFS implemented the Interim Groundfish Observer Program (Interim Program) in 1996, which superseded the *North Pacific Fisheries Research Plan (Research Plan)*. The requirements of the 1996 Interim Program were extended through 1997 (61 FR 56425, November 1, 1996), again through 1998 (62 FR 67755, December 30, 1997), again through 2000 (63 FR 69024, December 15, 1998) and once again through 2007 (67 FR 72595, December 6, 2002). An Environmental Analysis was prepared for rulemaking extending the Observer Program through 2007 and analyzes the biological effects of the Observer Program in its current form.

2.9 Coordination of program restructuring with GOA Rationalization

The Council is currently in the process of developing alternatives for its GOA groundfish rationalization program. Successful implementation of a rationalization program in the GOA will depend on the development of a practical and cost-effective monitoring program to ensure that groundfish and PSC catches are properly accounted.

NMFS currently manages the groundfish fisheries of the GOA by using a combination of reports from observers and processors. The current system was designed to provide the data necessary to manage aggregate groundfish and PSC quotas in open access fisheries. Under the current system, data reported to NMFS by CPs, shoreside processors, and at-sea observers are combined to generate aggregate estimates of total removals for each groundfish species or species group. PSC rates from observed vessels are extrapolated to provide estimates of total PSC bycatch on a fishery-by-fishery basis. This system is appropriate for the current fisheries in the GOA where TACs and PSC limits are managed in the aggregate. However, the current system is inadequate for monitoring rationalized fisheries because it was not designed to provide estimates of catch and bycatch on an individual vessel basis.

Because the GOA rationalization alternatives are still under development, it is not possible to outline in great detail the type of monitoring that will be necessary to implement the program. However, given the direction of the alternatives as they have progressed to date, it is possible to identify some of the monitoring issues that are likely to arise. As the Council's GOA rationalization alternatives and monitoring options develop, they should be closely integrated with the Observer Program restructuring effort, in order to ensure that the Council and NMFS do not develop a new Observer Program that cannot accommodate changes anticipated under GOA rationalization.

2.10 Applicable laws and statutory changes required to implement the alternatives

NOAA General Counsel, Alaska Region (GCAK) has made a preliminary determination that the Research Plan authority provided in the MSA (Section 313) to assess a fee for observer coverage cannot be applied to only a subset of the vessels in the fisheries for which the Council and NMFS have the authority to establish a fee program. Therefore, all of the alternatives except for Alternative 7, Option 7 (universal ex-vessel value fee program) are likely to require statutory authorization unless it is determined that different fees can be assessed against different fisheries or sectors.

One legislative strategy is for the Council and NMFS to recommend that future MSA reauthorization provide the necessary authority to implement the preferred Observer Program alternative. Alternatively, this amendment could represent a comprehensive package to be adopted by Congress.

In sum, there are several decision points associated with this action. The first group of decision points is associated with the formal alternatives and options:

1) Choice of scope among Alternatives 1-7, and Options 1-6;
2) Choice of fee program (ex-vessel value fee versus daily observer fee) for vessels and processors covered in Alternatives 6 and 7 (Option 7)
3) Choice to remove expiration date for vessels/processors that remain under the existing pay-as-you-go program (Option 8)

The second group of decision points is related to the elements of the program that are not exclusive to any particular alternative, but are common to all action alternatives:

4) Coverage requirements: Which vessels/processors will be placed in which coverage level tier?
5) Funding mechanism:
    - What is the initial fee percentage for vessels/processors being assessed an ex-vessel value fee?
    - Use of standardized (Alt. 2-3) or actual prices (Alt. 4-7)?
    - Who is responsible for collecting the fee: annual post-season billing by NMFS (Alt. 2 and 3) or processor collection at the time of landing using actual prices for catcher vessels (Alt. 4-7)?
    - Restriction on use of fee proceeds. Should the fee only be used to pay for costs directly associated with coverage by human observers or should fee proceeds be able to be used for supplemental or alternative monitoring technologies should they be proposed in the future?

Chapter 3 Environmental Assessment

An environmental assessment (EA) as described by the National Environmental Policy Act (NEPA) of 1969 is used to determine whether the Federal action considered will result in a significant impact on the human environment. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) will be the final environmental documents required by NEPA. If the analysis concludes that the proposal is a major Federal action significantly affecting the human environment, an environmental impact statement (EIS) must be prepared.

The environmental impacts generally associated with fishery management actions are effects resulting from: (1) harvest of fish stocks which may result in changes in food availability to predators and scavengers, changes in the population structure of target fish stocks, and changes in the marine ecosystem community structure; (2) changes in the physical and biological structure of the marine environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and (3) entanglement/entrapment of non-target organisms in active or inactive fishing gear.

3.1 Affected environment and management of the fisheries

Chapter 3 of the Alaska Groundfish Fisheries PSEIS (NMFS 2004) provides a detailed description of the affected environment including extensive information on the fishery management areas, marine resources, ecosystem, and economic parameters. The annual TAC Specifications EA describes, among other things, the TAC-setting process.

The mission of the observer program is to provide the highest quality data to promote stewardship of the North Pacific living marine resources for the benefit of the nation. The goal of the observer program is to provide information essential for the management of sustainable fisheries, associated protected resources, and marine habitat in the North Pacific. This goal is supported by objectives that include:

6. Provide accurate and precise catch, bycatch, and biological information for conservation and management of groundfish resources and the protection of marine mammals, seabirds, and protected species.
7. Provide information to monitor and promote compliance with NOAA regulations and other applicable programs.
8. Support NMFS and the Council policy development and decision making.
9. Foster and maintain effective communications.
10. Conduct research to support the mission of the North Pacific Groundfish Observer Program.

The Observer Program has an integral role in the management of North Pacific fisheries. Information collected by observers is used by managers, scientists, enforcement agents, and other agencies in supporting their own missions. Observers provide catch information for quota monitoring and management of groundfish and prohibited species, biological data and samples for use in stock assessment analyses, information to document and reduce fishery interactions with protected resources, and information and samples used in marine ecosystem research. The Observer Program provides information, analyses, and support in the development of proposed policy and management measures. Further, observers interact with the fishing industry on a daily basis and the Observer Program strives to promote constructive communication between the agency and interested parties. Observations are used by mangers and enforcement personnel to document the effectiveness of the management programs of various entities including NMFS, the U.S. Coast Guard, and the U.S. Fish and Wildlife Service. In order

to provide these services, the Observer Program Office routinely conducts research projects and analyses designed to assess the efficacy of management programs.

3.2 Environmental impacts of the alternatives

The effects of groundfish fishing on the ecosystem, social, and economic environment are contained in the PSEIS and are incorporated into this analysis by reference. This analysis includes only those effects that are additional and attributable to promulgation of rulemaking to continue and restructure the Observer Program. Analysis of impacts are based largely on analyses prepared for each stock, species, or species group in the BSAI and GOA are contained in the EA for the 2004 Total Allowable Catch (TAC) specifications. The TAC setting process is the basis for defining upper harvest limits, or fishery removals, for the subject fishing year. Catch specifications are made for each managed species or species group, and in some cases, by species and sub-area. Sub-allocations of TAC are made for biological and socio-economic reasons according to percentage formulas established through FMP amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Island, Bering Sea, Western, Central, and Eastern GOA) among management programs (open access or community development quota program), processing components (inshore or offshore), specific gear types (trawl, non-trawl, hook-and-line, pot, jig), and seasons. TAC can be sub-allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and for regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. The entire TAC amount is available to the domestic fishery. The gear authorized in the Federally managed groundfish fisheries off Alaska includes trawl, hook-and-line, longline pot, pot, and jig (50 CFR 679.2).

The fishing year coincides with the calendar year, January 1 to December 31. Depending on the target species' spatial allocation, additional specifications are made to particular seasons (defined portions of the year or combinations of defined portions of the year) within the fishing year. Any TACs not harvested during the year specified are not rolled over from that fishing year to the next. Fisheries are opened and closed by regulatory announcement. Closures are made when inseason information indicates the apportioned TAC or available PSC limit has been or will soon be reached, or at the end of the specified season, if the particular TAC has not been taken.

TAC specifications for the Federal groundfish fisheries are set annually. The process includes review of the Stock Assessment and Fishery Evaluation (SAFE) reports by the Council and by the Council's Advisory Panel (AP) and Scientific and Statistical Committee (SSC). Using the information from the SAFE Reports and the advice from Council committees, the Council makes both Acceptable Biological Catch (ABC) and TAC recommendations toward the next year's TAC specifications. NMFS packages the recommendations into specification documents and forwards them to the Secretary of Commerce for approval.

The Observer Program was implemented in 1990 to collect data necessary to support the management of the North Pacific fisheries. This includes monitoring harvest amounts consistent with specified TACs and the collection of data that is incorporated into annual stock assessments. The Observer Program provides information to monitor the effectiveness of, and compliance with, fisheries management decisions made through the annual TAC setting process and the effects they have on the human and natural environment.

Observer Program history and background information is discussed in Chapter 1 of this document. In October 2002, the Council and NMFS staff met to discuss ways to restructure the Observer Program to address data quality and cost equity issues. The following problem statement was approved by the Council in February 2003:

The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program structure is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have lead to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives."

This section forms the analytic basis for comparisons of the effects to the human environment across alternatives to restructure the Observer Program. Significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact (short versus long term), magnitude of impact (minor versus major), and degree of risk (high versus low level of probability of an impact occurring). Further tests of intensity include: (1) the potential for compromising the sustainability of any target or non-target species; (2) substantial damage to marine habitats and/or essential fish habitat (EFH); (3) impacts on public health and safety; (4) impacts on endangered or threatened species or critical habitat of listed species; (5) cumulative adverse impacts that could have substantial effects on target or non target species; (6) impacts on biodiversity and ecosystem function; (7) significant or economic impacts if significant social or economic impacts are interrelated with significant natural or physical environmental effects; and (8) degree of controversy (NAO 216-6, section 6.02).

Differences between direct and indirect effects are primarily linked to the time and place of the impact. Direct effects are caused by the action and occur at the same time and place as the impact of the action. Indirect effects occur later in time and/or further removed in distance from the direct effects (40 CFR 1508.27). For example, the direct effects of an alternative that lowers the harvest level of a target fish could include a beneficial impact on the targeted stock of fish, neutral impact on the ecosystem, and an adverse impact on net revenues to fishermen. The indirect effects of that action could include beneficial impacts on the ability of Steller sea lions to forage for prey, neutral impacts on incidental levels of PSC, and adverse impacts in the form of multiplier effects reducing employment and tax revenues to coastal fishing communities.

Note that the annual TAC specifications and PSC limits that are implemented each year through proposed and final rulemaking are separate and distinct actions from this one. Those actions are informed by an EA prepared annually on the TAC specifications and PSC limits. Likewise, parameters under which the North Pacific groundfish fisheries operate (who, what, where, when), remain in effect. Therefore, the effects of this proposed action and alternatives to it, which will determine some of the parameters under which those fisheries will be monitored, are evaluated based on the assumption that the effects of the fisheries themselves on the marine resources have been evaluated in separate NEPA analyses.

It is assumed that each alternative under consideration would be implemented in conjunction with harvest limits set annually by the TAC specification process and according to current regulations governing fishing within the EEZ off Alaska (50 CFR 679). Further, if overfishing levels were detected, NMFS and the Council would take action to close or curtail harvest effort.

Each section below includes an explanation of the criteria used to establish significance and a determination of 'significance' (beneficial or adverse), 'insignificance,' or 'unknown' for each resource, species, or issue being treated. These criteria are the same as those used to evaluate the effects on resources of alternatives proposed for the TAC setting process. In general, the discussions and rating criteria are qualitative in nature. In instances where criteria to determine significance does not logically exist, none are noted. These situations are termed "not applicable" (NA) in the criteria tables. The significance determinations are summarized in each section.

The rating terminology used to determine significance are the same for each resource, species, or issue treated, although the reference points for each may differ. The generic definitions for the assigned ratings are as follows:

S+ Significant beneficial effect in relation to the reference point; this determination is based on interpretations of available data and the judgment of the analysts who addressed the topic.

I Insignificant effect in relation to the reference point; this determination is based on interpretations of available data and the judgment of the analysts, which suggests they are small and within the "normal" variability surrounding the reference point.

S- Significant adverse effect in relation to the reference point; this determination is based on interpretations of available data and the judgment of the analysts who addressed the topic.

U Unknown effect in relation to the reference point; this determination is made in the absence of information or data suitable for interpretation with respect to the question of impacts on the resource, species, or issue.

3.2.1 Effects of expiration of the program under the no action alternative

Under the no action alternative (Alternative 1), the Observer Program would expire at the end of 2007, if no other action is taken to extend the program. Although the Council has a history of extending the interim Observer Program, the expiration of the Observer Program warrants brief discussion. Alternative 2 of the final PSEIS (NMFS 2004) analyzes the effects of the elimination of the Observer Program. The expiration of the Observer Program would apply to all groundfish fisheries with the exception of the AFA and CDQ pollock fisheries, thus representing an 80% reduction in observer days. The AFA is separate legislation mandating certain levels of observer coverage and this legislation would remain in effect regardless of the expiration of the program in 2007. However, without the Observer Program, there is no mechanism with which this coverage can be provided. The implications of this expiration are discussed in the draft PSEIS relative to target species, the food web, bycatch, and allocation issues.

Also under Alternative 2 of the PSEIS, existing requirements for vessel captains to provide estimates of total catch and discards, limited species composition data, and haul times and locations would continue. However, observers provide additional information on commercial fishing harvests that may not be otherwise captured by survey vessels or vessel logbook information. Stock assessment data is collected by observers, such as age structures and stomach samples, and fishery scientists use the Observer Program as a platform from which to complete special projects. Also, interactions with marine mammals

and endangered seabirds are recorded by observers. The expiration of the Observer Program would increase the reliance on industry data, which is less accurate in terms of total catch and discard estimates, and is not as precise in terms of species reporting. As a result, stock assessment scientists may adapt to the lack of precision by generating more conservative catch limit estimates.

While the potential expiration of the current program regulations warrants discussion, Alternative 1 (no action) does not represent the elimination of the North Pacific Groundfish Observer Program in this document. Alternative 1 represents the situation in which no restructuring effort is undertaken, and the existing pay-as-you-go system for observer coverage remains in place.

3.2.2 Effects on fish species

Assessing the effects of each alternative on target commercial fish species was accomplished by asking the following questions of each of the seven alternatives for each target species or species group for which a TAC amount is being specified:

- How much effect does the alternative have on fishing mortality?
- How much effect does the alternative have on spatial or temporal concentration of the species?
- How much effect does the alternative have on the availability of prey for the target species?
- How much effect does the alternative have on the target species' habitat?

Analyses of impacts are based largely on analyses prepared for each stock, species, or species group in the BSAI and GOA contained in the EA for the annual TAC setting process. These ratings use a minimum stock size threshold (MSST) as a basis for positive or negative impacts of each alternative. A thorough description of the rationale for the MSST can be found in National Standard Guidelines 50 CFR 600 (63 FR 24212-24237). The TACs, as specified, are based on spawning stock biomass that are expected to be above the MSST, and the probability that overfishing would occur within the TAC levels is low for all the stocks. The target species stocks are currently above their MSSTs and, based on the TAC levels, overfishing of spawning stock would not be expected. Therefore genetic integrity and reproductive potential of the stocks should be preserved.

Table 3.2-1 Criteria used to estimate significance of direct effects on targeted groundfish stocks in the BSAI and GOA under Alternatives 1-7

Direct Effects	Significant Adverse	Significant Beneficial	Insignificant	Unknown
Fishing Mortality	Reasonably expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	NA	Reasonably *not* expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	Unknown fishing mortality rate
Leads to change in genetic structure of population	Evidence of genetic sub-population structure and evidence that monitoring distribution of harvest leads to detectable decrease in genetic diversity such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence of genetic sub-population structure and evidence that monitoring distribution of harvest leads to detectable increase in genetic diversity such that it enhances the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring distribution of harvest is *not* sufficient to alter the genetic sub-population structure such that it jeopardizes the ability the of the stock to sustain itself at or above the MSST	MSST and genetic structure is unknown. Therefore no information to evaluate whether monitoring distribution of the catch changes the genetic structure of the population such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST
Change in reproductive success	Evidence that monitoring distribution of harvest leads to detectable decrease in reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring distribution of harvest leads to detectable increase in reproductive success such that it enhances the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring distribution will *not* change reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown. Therefore no information regarding the potential impact of monitoring distribution of the catch on reproductive success such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST

Indirect Effects	Significant Adverse	Significant Beneficial	Insignificant	Unknown
Change in prey availability	Evidence that monitoring current harvest levels and distribution of harvest lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring current harvest levels and distribution of harvest do *not* lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown. Therefore no information that monitoring current harvest levels and distribution of the harvest lead to a change in prey availability such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST
Habitat: Change in suitability of spawning, nursery, or settlement habitat	Evidence that monitoring current levels of habitat disturbance are sufficient to lead to a decrease in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring current levels of habitat disturbance are sufficient to lead to an increase in spawning or rearing success such that it enhances the ability of the stock to sustain itself at or above the MSST	Evidence that monitoring current levels of habitat disturbance are *not* sufficient to lead to a detectable change in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown. Therefore no information that monitoring current levels of habitat disturbance are sufficient to lead to a detectable change in spawning or rearing success such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST

Table 3.2-2 Summary of impacts of Alternatives 1-7 on targeted groundfish stocks

Summary of Impacts:	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
Direct Effects							
Fishing Mortality	I	I	I	I	I	I	I
Changes in genetic structure of population	I	I	I	I	I	I	I
Changes in reproductive success	I	I	I	I	I	I	I
Indirect Effects							
Change in prey availability	I	I	I	I	I	I	I
Change in suitability of spawning, nursery, or settlement habitat	I	I	I	I	I	I	I

Summary of the effects of Alternative 1 on fish stocks. Alternative 1 is the status quo alternative and monitoring levels are considered to be baseline with respect to the other alternatives. Under this alternative, there would be no immediate changes to the observer program. There would be no additional effects outside those analyzed in previous NEPA documents.

Summary of the effects of Alternatives 2-7 on fish stocks. Alternatives 2 - 7 propose restructuring of the funding and observer deployment mechanism, and potentially extending coverage to various fleets that do not have current coverage requirements. These include vessels under 60' LOA, halibut vessels, and additional GOA-based shoreside processors. To the extent that the proposed changes to the Observer Program will provide managers with better estimates of target and bycatch harvest rates, increased flexibility in deploying observers, and harvest rates will remain within TAC levels, impacts to the target species stock, species, or species group are predicted to be insignificant for all target fish stocks evaluated. The proposed alternatives appear to meet the following significance criteria : (1) they would not be expected to jeopardize the capacity of the stock to produce maximum sustainable yield on a continuing basis; (2) they would not alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the MSST; (3) they would not alter harvest levels such that it jeopardizes the ability of the stock to sustain itself at or above the MSST; (4) they would not alter harvest levels or distribution of harvest such that prey availability would jeopardize the ability of the stock to sustain itself above minimum stock size threshold; (5) they would not disturb habitat at a level that would alter spawning or rearing success such that it would jeopardize the ability of the stock to maintain itself above the minimum stock size threshold.

3.2.3 Effects on prohibited species

Prohibited species in the groundfish fisheries include: Pacific salmon (Chinook, Coho, sockeye, chum, and pink), steelhead trout, Pacific halibut, Pacific herring, and Alaska king, Tanner, and snow crab. The most recent review of the status of crab stocks may be found in the 2002 Crab SAFE (NPFMC, 2002a) and for the other species in Section 3.5 of the Steller Sea Lion Protection Measures SEIS (NMFS, 2001). The effects of the groundfish fisheries in the BSAI and GOA on prohibited species are primarily managed

by conservation measures developed and recommended by the Council over the entire history of the FMPs for the BSAI and GOA and implemented by Federal regulation. These measures can be found at 50 CFR part 679.21 and include PSC limitations on a year round and seasonal basis, year round and seasonal area closures, gear restrictions, and an incentive plan to reduce the incidental catch of prohibited species by individual fishing vessels. These management measures are discussed in Section 3.5 of the SSL SEIS (NMFS, 2001).

Pacific salmon are managed by the State of Alaska on a sustained yield principal. Pre-determined escapement goals for each salmon stock are monitored on an in-season basis to insure long term sustainable yields. When escapement levels are low, commercial fishing activities are curtailed. If escapement levels exceed goals, commercial fishing activities are enhanced by longer open seasons. In instances where minimum escapement goals are not met, sport and subsistence fishing activities may also be curtailed. The criteria used to determine the significance of effects under each alternative on salmon stocks was whether or not salmon escapement needs would reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed insignificant, if the alternative was reasonably expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed significantly adverse, where insufficient information exists to make such conclusions the alternative's effects are unknown.

The IPHC is responsible for the conservation of the Pacific halibut resource. The IPHC uses a policy of harvest management based on constant exploitation rates. The constant exploitation rate is applied annually to the estimated exploitable biomass to determine a constant exploitation yield (CEY). The CEY is adjusted for removals that occur outside the directed hook-and-line harvest (incidental catch in the groundfish fisheries, wastage in halibut fisheries, sport harvest, and personal use) to determine the directed hook-and-line quota. Incidental catch of halibut in the groundfish fisheries results in a decline in the standing stock biomass, a lowering of the reproductive potential of the stock, and reduced short and long term yields to the directed hook-and-line fisheries. To compensate the halibut stock for these removals over the short term, halibut mortality in the groundfish fisheries is deducted on a pound for pound basis each year from the directed hook-and-line quota. Halibut incidentally taken in the groundfish fisheries are of smaller average size than those taken in the directed fishery and results in further impacts on the long term reproductive potential of the halibut stock. This impact, on average, is estimated to reduce the reproductive potential of the halibut stock by 1.7 pounds for each 1 pound of halibut mortality in the groundfish fisheries. These impacts are discussed by Sullivan *et. al.*(1994). The criteria used to determine the significance of effects under each alternative on the halibut stock was whether or not incidental catch of halibut in the groundfish fisheries would be reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds.

If the alternative was not reasonably expected to decrease the total CEY of the halibut stock below the long term estimated yield of 80 million pounds, it was rated insignificant. If the alternative was reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds, it was rated significantly adverse. Where insufficient information exists to make such conclusions, the alternative's effects are rated unknown.

Pacific herring are managed by the State of Alaska on a sustained yield principal. Pacific herring are surveyed each year and the Guideline Harvest Levels (GHLs) are based on an exploitation rate of 20% of the projected spawning biomass. These GHLs may be adjusted inseason based on additional survey information to insure long term sustainable yields. The Alaska Department of Fish and Game (ADF&G) has established minimum spawning biomass thresholds for herring stocks which must be met before a commercial fishery may occur. The criteria used to determine the significance of effects on herring stocks under each alternative was whether minimum spawning biomass threshold levels would reasonably

expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels, it was deemed insignificant. If the alternative was reasonably expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels, it was deemed significantly adverse. Where insufficient information exists to make such conclusions, the alternative's effects are unknown.

Alaska king, Tanner, and snow crab stocks in the BSAI are protected by area trawl closures and PSC limitations. MSSTs have been established for these crab species stocks to help prevent overfishing. The criteria used to determine the significance of effects under each alternative on crab stocks was whether MSST levels would be reasonably expected to occur. If the alternative was reasonably not expected to jeopardize the capacity of the crab stocks to maintain MSST levels, it was deemed insignificant. If the alternative was reasonably expected to jeopardize the capacity of the crab stocks to reach maintain MSST levels, it was deemed significantly negative. Where insufficient information exists to make such conclusions, the alternative's effects are unknown.

The annual halibut PSC limits in the directed fisheries of the GOA and the annual and seasonal apportionments of all PSC limits to gear types and targets in the BSAI and GOA are of critical importance in both minimizing the incidental catch of prohibited species and in maximizing the optimum yield from the groundfish resources. National Standard 9 directs that when a regional council prepares an FMP they shall, to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. Since the enactment of the MSA in 1976, the Council has recommended and NMFS has implemented over 30 FMP amendments designed to help minimize the incidental catch and mortality of prohibited species. Levels of incidental catch of prohibited species in each fishery in 2003 were used to estimate the effects TAC levels set for each fishery on incidental catch levels of prohibited species under each alternative. It was assumed for each fishery that an increase or decrease in TAC would result in a proportional increase or decrease in incidental catch, increases were not assumed to exceed PSC limitations where applicable.

Table 3.2-3 Criteria used to estimate significance of effect of PSC on prohibited species in the BSAI and GOA under Alternatives 1-7

Intensity of Effect	*Significant Adverse*	*Significant Beneficial*	*Insignificant*	*Unknown*
Fishing Mortality	Reasonably expected to jeopardize the capacity of the stock to maintain reference point population levels*	NA	Reasonably not expected to jeopardize the capacity of the stock to maintain reference point population levels	Insufficient information available

* population reference points: Pacific salmon - minimum escapement goals; Pacific halibut - estimated long term CEY level; Pacific herring - minimum spawning biomass threshold; crab - minimum stock size threshold.

Table 3.2-4 Summary of impacts of Alternatives 1-7 on prohibited species

Summary of impacts of incidental catch of prohibited species	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
Pacific salmon	I	I	I	I	I	I	I
Pacific halibut	I	I	I	I	I	I	I
Pacific herring	I	I	I	I	I	I	I
Crab	I	I	I	I	I	I	I

Summary of the effects of Alternative 1 on prohibited species. Monitoring levels under Alternative 1 (no action) are considered the baseline with respect to the other alternatives. Under Alternative 1, there would be no immediate changes to the Observer Program, and there would be no additional effects beyond those analyzed in previous NEPA documents.

Summary of the effects of Alternatives 2-7 on prohibited species. Alternatives 2-7 propose restructuring the observer deployment and funding mechanism of the current observer program and extending the ability to deploy observers to various fleets that do not currently have coverage requirements (vessels under 60', and halibut vessels). In general, harvest information collected by observers, together with information from other sources, is used by NMFS' in-season managers to assess PSC. Where harvest information is not timely or is inaccurate, fisheries are occasionally closed after PSC levels have been reached, resulting in overharvest of PSC species. The more observer information available to managers, the more closely the closures will approximate the intended PSC levels set by the Council.

To the extent that changes to the deployment of observers will provide managers with better estimates of incidental and directed take of prohibited species, more flexibility in deploying observers, and harvest rates will remain below PSC limits, effects on mortality levels of each prohibited species group are expected to be insignificant. They are not reasonably expected to jeopardize the capacity of the stock to maintain reference point population levels.

3.2.4 Effects on marine mammals

Under the Marine Mammal Protection Act, commercial fisheries are classified according to current and historical data on the level of interaction each fishery has with marine mammals. Fisheries that interact with a strategic stock at a level of take which has a potentially significant impact on that stock would be placed in Category I. Fisheries that interact with a strategic stock and whose level of take has an insignificant impact on that stock, or interacts with a non-strategic stock at a level of take which has a significant impact on that stock are placed in Category II. A fishery that interacts only with non-strategic stocks and whose level of take has an insignificant impact on the stocks is placed in Category III.

Species listed under the Endangered Species Act (ESA) present in the management areas are listed below. Marine mammals not listed under the ESA that may be present in the BSAI and GOA management area include cetaceans, [minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), Dall's porpoise *(Phocoenoides dalli*), harbor porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and the beaked whales (e.g., *Berardius bairdii* and *Mesoplodon spp*.)] as well as pinnipeds [Pacific harbor seal (*Phoca vitulina*), northern fur seal (*Callorhinus ursinus*), Pacific

walrus (*Odobenus rosmarus*), spotted seal (*Phoca largha*), bearded seal (*Erignathus barbatus*), ringed seal (*Phoca hispida*) and ribbon seal (*Phoca fasciata*)], and the sea otter (*Enhydra lutris*)].

Take of the above listed marine mammals in trawl fisheries has been monitored through the Observer Program. Steller sea lion, harbor seal, northern elephant seal, and Dall's porpoise were taken incidentally in the GOA groundfish trawl fisheries according to records dating back to 1990 (Hill et al 1997). Steller sea lion, northern fur seal, harbor seal, spotted seal, bearded seal, ribbon seal, ringed seal, northern elephant seal, Dall's porpoise, harbor porpoise, Pacific white-sided dolphin, killer whale, sea otter, and walrus were taken incidentally in the BSAI groundfish trawl fisheries according to records dating back to 1990 (Hill et al 1997.)

For ESA-listed marine mammals, Steller sea lions were the only species listed that were determined to potentially be adversely affected by the groundfish fisheries in the Biological Opinion (BiOp) prepared on the FMPs (NMFS 2000). Steller sea lion protection measures are implemented as part of the harvest specifications so no adverse effects on the ESA listed mammals are expected beyond those previously analyzed. Informal ESA consultation for the interim and final specifications was completed on November 26, 2002.

Marine mammals were considered in groups that include: Steller sea lions, ESA listed great whales, other cetaceans, northern fur seals, harbor seals, other pinnipeds, and sea otters. Direct and indirect interactions between marine mammals and groundfish harvest occur due to overlap in the size and species of groundfish harvested in the fisheries that are also important marine mammal prey, and due to temporal and spatial overlap in marine mammal foraging and commercial fishing activities.

Impacts of proposed harvest levels are analyzed by addressing four core questions modified from Lowry (1982):

1. Does the proposed action result in increases in direct interactions with marine mammals (incidental take and entanglement in marine debris)?
2. Does the proposed action remove prey species at levels that could compromise foraging success of marine mammals (harvest of prey species)?
3. Does the proposed action result in temporal or spatial concentration of fishing effort in areas used for foraging by marine mammals (spatial and temporal concentration of removals with some likelihood of localized depletion)?
4. Does the proposed action modify marine mammal foraging behavior to the extent that population level impacts could occur (disturbance)?

The reference point for determining significant impacts to marine mammals is predicting whether the proposed harvest levels will impact the current population trajectory of any marine mammal species. Criteria for determining significance and significance ratings for each question are summarized below.

Direct Effects - Incidental Take/Entanglement in Marine Debris. Annual levels of incidental mortality and serious injury are estimated by comparing the ratio of observed incidental take of dead animals to observed groundfish catch (stratified by area and gear type). Incidental bycatch frequencies also reflect locations where fishing effort is highest. In the Aleutian Islands and GOA, incidental takes are often within Steller sea lion critical habitat. In the Bering Sea, takes are farther off shore and along the continental shelf. Otherwise there seems to be no apparent "hot spot" of incidental catch disproportionate with fishing effort. Changes to the Observer Program design and funding mechanism are not anticipated to have significant effects on the annual levels of incidental mortality of marine mammals.

Indirect Effects - Spatial and Temporal Concentration of Fishery. Spatial and temporal concentration effects by these fisheries have recently been analyzed and modified to comply with ESA considerations for Steller sea lions. The criteria for insignificant effect determination is based on the assumption of the Steller sea lion protection measures analysis and section 7 biological opinion that the fishery, as modified by SSL Protection Measures, mitigates the impacts. That determination applies to all marine mammal species in these management areas.

Indirect Effects - Disturbance Effects. Vessel traffic, nets moving through the water column, or underwater sound production may all represent perturbations, which could affect marine mammal foraging behavior. Foraging could potentially be affected not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities. In other words, disturbance to the prey base may be as relevant a consideration as disturbance to the predator itself. For the purposes of this analysis, it is recognized that some level of prey disturbance may occur as a result of fishing.

There has been a recent change in ESA status of the northern sea otter. The southwest Alaska Distinct Population Segment (DPS or 'stock') of northern sea otter has been proposed by the U.S. Fish and Wildlife Service (USFWS) for listing under the ESA. The USFWS has observed a steady decline in abundance of this stock. The reasons for the decline are unknown, but population studies suggest that adult mortality appears to be a major source. The USFWS published a proposed rule on February 11, 2004 (69 FR 6600) to list this sea otter stock as threatened under the ESA. While the listing process has continued, the USFWS has not made a final decision. The agency is currently in the process of preparing the final rule, which is expected to be published in 2005. The final rule is likely to be one of three potential determinations: that insufficient information exists to warrant listing the stock at this time; to list the stock as threatened; or to list the stock as endangered. If listed, the agency would begin work on a recovery plan. Designation of critical habitat for this species would be a separate process. Alaska groundfish fisheries currently are not known to adversely interact with or impact this sea otter stock through either spatial or temporal overlap with sea otter distribution or through the harvest of fish or shellfish species that are important to the sea otter diet.[12]

Table 3.2-5 Criteria used to estimate significance of effect on marine mammals in the BSAI and GOA under Alternatives 1-7

Intensity of Effect	*Significant Adverse*	*Significant Beneficial*	*Insignificant*	*Unknown*
Incidental take/ entanglement in marine debris	Take rate increases by ≥25%	NA	Level of take below that which would have an effect on population trajectories	Insufficient information available on take rates
Spatial/temporal concentration of fishery	More temporal and spatial concentration in key areas	Much less temporal and spatial concentration of fishery in key areas	Spatial concentration of fishery as modified by SSL protection measures	Insufficient information as to what constitutes a key area
Disturbance	More disturbance	NA	Similar level of disturbance as that which was occurring in 2001	Insufficient information as to what constitutes disturbance

[12] One sea otter was reportedly taken in a trawl in 1997 in the BSAI, but no takes have been reported in the Alaska groundfish fisheries since then, according to the latest sea otter stock assessment (Angliss and Lodge, 2003).

Table 3.2-6 Summary of impacts of Alternatives 1-7 on marine mammals

Summary of Impacts:	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
Incidental take/ entanglement in marine debris	I	I	I	I	I	I	I
Spatial/temporal concentration of fishery	I	I	I	I	I	I	I
Disturbance	I	I	I	I	I	I	I

Summary of the effects of Alternative 1 on marine mammals. Monitoring levels under Alternative 1 (no action) are considered to represent the baseline with respect to the other alternatives. Under Alternative 1, there would be no changes to the current funding and deployment mechanism of the existing observer program. This alternative would propose no additional effects outside those analyzed in previous NEPA documents.

Summary of the effects of Alternatives 2-7 on marine mammals. Under Alternatives 2-7, managers of marine mammal resources will have better information on direct and indirect interactions with groundfish fisheries and increased flexibility to meet management objectives. The effects of these alternatives on marine mammals and their habitat are considered insignificant. These alternatives are not expected to alter current rates of interaction beyond those already evaluated in the Final PSEIS (NMFS, 2004). Significant incentives for compliance with marine mammal protection management measures would remain in place. Spatial and temporal concentration effects by these fisheries, vessel traffic, nets moving through the water column, or underwater sound production which could affect marine mammal foraging behavior, will not be affected by any of the proposed action alternatives.

3.2.5 Effects on seabirds

Given the sparse information, it is not likely that the fishery effects on most individual bird species are discernable. For reasons explained in the PSEIS, the following species or species groups are considered: northern fulmar, short-tailed albatross, spectacled eider, Steller's eiders, albatrosses and shearwaters, piscivorus seabird species, and all other seabird species not already listed. The fishery effects that may impact seabirds are direct effects of incidental take (in gear and vessel strikes), and indirect effects on prey (forage fish) abundance and availability, benthic habitat, and processing waste and offal. ESA consultation between NMFS and the USFWS is ongoing for the short-tailed albatross, spectacled eider, and Steller's eider.

Direct Effects - Incidental take. The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the PSEIS. Birds are taken incidentally in longline, trawl, and pot gear, although the vast majority occurs in the longline fisheries and is comprised primarily of the following species or species groups: fulmars, gulls, shearwaters, and albatrosses. Therefore, this analysis of incidental take focuses primarily on the longline fisheries and those species.

As noted in Section 4.1.3.3 of the PSEIS, several factors are likely to affect the risk of incidental catch of seabirds. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks) each year. But, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in

the probability of a bird getting hooked. Seabird bycatch avoidance measures for each alternative (including the preferred alternative) in Section 4.10.6.6 of the PSEIS.

Indirect Effects - Prey (forage fish) abundance and availability. A description of the effects of prey abundance and availability on seabirds is in Section 3.7.1 of the PSEIS. Detailed conclusions or predictions cannot be made, however, the present understanding is fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations.

Indirect Effects - Benthic habitat. The indirect fishery effect on benthic habitat as utilized by seabirds are described in Section 4.3.3.1 of the Final PSEIS. The seabird species most likely to be impacted by any indirect gear effects on the benthos would be diving sea ducks such as eiders and scooters as well as cormorants and guillemots. Bottom trawl gear has the greatest potential to indirectly affect seabirds via their habitat. Thus, the remainder of this analysis will be limited to the impacts of bottom trawl gear on foraging habitat.

Indirect Effects - Processing waste and offal. The volume of offal and processing wastes probably changes approximately in proportion to the total catch in the fishery. Whereas some bird populations may benefit from the food supply provided by offal and processing waste, the material also acts as an attractant that may lead to increased incidental take of some seabird species. This impact would need to be considered in the balance of the beneficial and detrimental impacts of the disposal actions.

Criteria used to determine significance of effects on seabirds. Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. When complete information is not available to reach a strong conclusion regarding impacts, the rating of 'unknown' is used. Table 3.2-6 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Table 3.2-7 Criteria used to estimate significance of effect on seabirds in the BSAI and GOA under Alternatives 1-7

Intensity of Effects	*Significant Adverse*	*Significant Beneficial*	*Insignificant*	*Unknown*
Incidental take	Take number and/or rate increases substantially and impacts at the population or colony level	Take number and/or rate decreases substantially and impacts at the population or colony level	Take number and/or rate is the same	Take number and/or rate is not known
Prey (forage fish) availability	Prey availability is substantially reduced and causes impacts at the population or colony level	Prey availability is substantially increased and causes impacts at the population or colony level	Prey availability is the same	Changes to prey availability are not known
Benthic habitat	Impact to benthic habitat is substantially increased and impacts at the population level or within critical habitat	Impact to benthic habitat is substantially decreased and impacts at the population level or within critical habitat	Impact to benthic habitat is the same	Impact to benthic habitat is not known
Processing waste and offal	Availability of processing wastes is substantially decreased and impacts at the population or colony level	Availability of processing wastes is substantially increased and impacts at the population or colony level	Availability of processing wastes is the same	Changes in availability of processing wastes is not known

Table 3.2-8 Summary of impacts of Alternatives 1-7 on seabirds

Summary of Impacts:	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
Incidental take	I	I	I	I	I	I	I
Prey (forage fish) availability	I	I	I	I	I	I	I
Benthic habitat	I	I	I	I	I	I	I
Processing waste and offal	I	I	I	I	I	I	I

Summary of the effects of Alternative 1 on seabirds. Monitoring levels under Alternative 1 (no action) represent the baseline with respect to the other alternatives. Under this alternative, there would be no changes to the current funding and observer deployment mechanism of the existing interim observer program. Thus, there would be no additional effects outside those analyzed in previous NEPA documents.

Summary of the effects of Alternatives 2-7 on seabirds. Alternatives 2-7 are anticipated to result in better observer data related to direct and indirect interactions with groundfish fisheries and increased flexibility to meet management objectives. The effects of these alternatives on seabirds are considered insignificant. The changes to the Observer Program proposed under Alternatives 2-7 are not expected to affect current rates of interaction. Changes in the indirect effects of fisheries on prey (forage fish) abundance and availability, benthic habitat as utilized by seabirds, and processing of waste and offal, all of which could affect seabirds, are not expected by these alternatives.

3.2.6 Effects on endangered or threatened species

The Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq*; ESA), provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by NMFS for most marine mammal species, marine and anadromous fish species, and marine plant species and by the USFWS for bird species, and terrestrial and freshwater wildlife and plant species. In addition to listing species under the ESA, the critical habitat of a newly listed species must be designated concurrent with its listing to the "maximum extent prudent and determinable" [16 U.S.C. § 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. Federal agencies are prohibited from undertaking actions that destroy or adversely modify designated critical habitat.

Federal agencies have an affirmative mandate to conserve listed species (Rohlf 1989), thus Federal actions, activities, or authorizations (hereafter referred to as Federal action) must be in compliance with the provisions of the ESA. Section 7 of the Act provides a mechanism for consultation by the Federal action agency with the appropriate expert agency (NMFS or USFWS). Informal consultations, resulting in letters of concurrence, are conducted for Federal actions that have no adverse affects on the listed species. Formal consultations, resulting in biological opinions, are conducted for Federal actions that may have an adverse affect on the listed species. Through the biological opinion, a determination is made as to whether the proposed action poses "jeopardy" or "no jeopardy" of extinction to the listed species.

If the determination is that the action proposed will cause jeopardy, reasonable and prudent alternatives may be suggested which, if implemented, would modify the action to no longer pose the jeopardy of extinction to the listed species. These reasonable and prudent alternatives must be incorporated into the Federal action if it is to proceed. A biological opinion with the conclusion of no jeopardy will contain an

incidental take statement if a likelihood exists of any take[13] occurring during promulgations of the action. The incidental take statement is appended to a biological opinion and provides for the amount of take that is expected to occur from normal promulgation of the action. An incidental take statement is not the equivalent of a permit to take. Further, if incidental take is expected, then reasonable and prudent measures are specified that are necessary or appropriate to minimize the impact of the take (50 CFR 402.14(i)). A biological opinion with the conclusion of no jeopardy may contain a series of conservation recommendations intended to further reduce the negative impacts to the listed species. These management measures are advisory to the action agency (50 CFR 402.14(j)).

Though all the Federal fishery actions have been through Section 7 consultations, it is periodically necessary to re-initiate Section 7 consultations. NMFS typically views any subsequent action (such as consideration of a new fishery management plan amendment or a new regulatory action) as a point to determine whether a re-initiation is necessary. The regulations state: "Re-initiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) If a new species is listed or critical habitat designated that may be affected by the identified action." (50 CFR 402.16).

[13] The term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct" [16 U.S.C. § 1538(a)(1)(B)].

Table 3.2-9 Species listed as endangered or threatened under the ESA and occurring in the GOA and/or BSAI groundfish management areas

Common Name	*Scientific Name*	*ESA Status*
Northern Right Whale	*Balaena glacialis*	Endangered
Bowhead Whale [1]	*Balaena mysticetus*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Blue Whale	*Balaenoptera musculus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Snake River Sockeye Salmon	*Onchorynchus nerka*	Endangered
Short-tailed Albatross	*Phoebastria albatrus*	Endangered
Steller Sea Lion	*Eumetopias jubatus*	Endangered and Threatened [2]
Snake River Fall Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Snake River Spring/Summer Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Puget Sound Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Lower Columbia River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Willamette River Chinook Salmon	*Onchorynchus tshawytscha*	Threatened
Upper Columbia River Spring Chinook Salmon	*Onchorynchus tshawytscha*	Endangered
Upper Columbia River Steelhead	*Onchorynchus mykiss*	Endangered
Snake River Basin Steelhead	*Onchorynchus mykiss*	Threatened
Lower Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Upper Willamette River Steelhead	*Onchorynchus mykiss*	Threatened
Middle Columbia River Steelhead	*Onchorynchus mykiss*	Threatened
Spectacled Eider	*Somateria fishcheri*	Threatened
Steller's Eider	*Polysticta stelleri*	Threatened
Northern Sea Otter	*Enhydra lutris*	Candidate

[1] The bowhead whale is present in the Bering Sea area only.

[2] Steller sea lion are listed as endangered west of Cape Suckling and threatened east of Cape Suckling.

ESA Listed Marine Mammals. A Biological Opinion was written on Alternative 4 (the preferred alternative) for the Steller Sea Lion Protection Measures SEIS (NMFS 2001). The 2001 Biological Opinion concluded the Alternative 4 suite of management measures would not likely jeopardize the continued existence of the western or eastern populations of Steller sea lions, nor would it adversely modify the designated critical habitat of either population. It is important to point out that the 2001 Biological Opinion does not ask if Alternative 4 helps the Steller sea lion population size recover to some

specified level so that the species could be de-listed, but rather asks if Alternative 4 will jeopardize the Steller sea lion's chances of survival or recovery in the wild. While the Biological Opinion concludes that Alternative 4 does not jeopardize the continued survival and recovery of Steller sea lions, it identifies four reasonable and prudent measures as necessary and appropriate to minimize impacts of the fisheries to Steller sea lions under Alternative 4. The measures are: (1) monitoring the take of Steller sea lions incidental to the BSAI and GOA groundfish fisheries; (2) monitoring all groundfish landings; (3) monitoring the location of all groundfish catch to record whether the catch was taken inside critical habitat; and (4) monitoring vessels fishing for groundfish inside areas closed to pollock, Pacific cod, and Atka mackerel to see if they are illegally fishing for those species. Informal consultation for all ESA listed marine mammal species was completed November 26, 2002.

ESA Listed Pacific Salmon. When the first Section 7 consultations for ESA listed Pacific salmon taken by the groundfish fisheries were done, only three evolutionary significant units (ESU)s of Pacific salmon were listed that ranged into the fishery management areas. Additional ESUs of Pacific salmon and steelhead were listed under the ESA in 1997, 1998, and 1999. Only the Snake River fall Chinook salmon has designated critical habitat and none of the designated habitat is marine habitat (Table 3.2-8). In 2000, formal consultation was reinitiated for all twelve ESUs of ESA listed Pacific salmon that are thought to range into Alaskan waters. The resulting biological opinion determined that the groundfish fisheries were not likely to jeopardize the continued existence of these species. The FMP-level consultation included reconsideration of all of the listed species of Pacific salmon thought to range into the management area; this consultation determined again that there was no jeopardy for all ESUs.

No new information is available on ESA listed salmon and the groundfish fisheries beyond what was considered in the December 22, 1999, biological opinion on the effects of the groundfish fisheries on listed salmon and the subsequent FMP level biological opinion.

ESA Listed Seabirds. The Biological Opinion on the effects of the groundfish fisheries on listed seabird species expired December 31, 2000. Two Section 7 consultations on the effects of the Alaska groundfish fisheries on the endangered short-tailed albatross and the threatened Steller's eider were reinitiated in 2000. The first was an FMP-level consultation on the effects of the BSAI and GOA FMPs in their entirety on the listed species (and any designated critical habitat) under the jurisdiction of the USFWS. The second consultation was on the effects of Council's TAC setting process for the BSAI and GOA groundfish fisheries. The biological opinions concluded that implementation of the groundfish fishery FMPs and the actions related to the TAC-setting process are not likely to jeopardize the continued existence of these species.

An Incidental Take Statement (ITS) accompanies the TAC-setting BiOp. This ITS authorizes the incidental take of four short-tailed albatross over a two year period in the Alaskan hook-and-line groundfish fisheries, and an incidental take of two short-tailed albatross in the Alaskan trawl groundfish fisheries over the time period the biological opinion remains in effect (about five years). These incidental take limits are in addition to the take limit established in 1998 for the Pacific halibut hook-and-line fishery off Alaska, two short-tailed albatrosses in a two year period. If the level of anticipated take is exceeded in any of these fisheries, NMFS must immediately reinitiate a consultation with the USFWS to review the need for possible modification to the fishery. The ITS also includes specific Reasonable and Prudent Measures NMFS must take to minimize the potential for take of these species.

Effects of Alternatives 1-7: Section 7 consultations have been done for all of the ESA listed species occurring in the BSAI and GOA groundfish management areas. The purpose of the proposed Federal action is the improvement of an observer monitoring program that contributes to the assessment of potential interactions between the Federal groundfish fisheries and ESA-listed species. Thus, the proposed action is not anticipated to have any significant negative effect.

3.2.7 Ecosystem considerations

Section 4.9 of the 2004 TAC Specifications EA analyzed the effects of these fisheries on the ecosystem. Different ecosystem indicators were separated into categories related to physical oceanography, habitat, target groundfish, forage, other species, marine mammals, seabirds, and the aggregate indicators which relate to trophic levels of catch in the fishery management areas. Observations were made about each of the indicators followed by an interpretation of that observation with relation to ecosystem function.

Beginning with the 2003 SAFE reports, individual groundfish stock assessment chapters included an ecosystem assessment. Within each section are three subsections: (1) Ecosystem effects on stock; (2) Fishery effects on the ecosystem; and (3) Data gaps and research priorities. These provide information on how various ecosystem factors might be influencing the subject stock, how the specific stock fishery might be affecting the ecosystem, and what data gaps might exist that prevent assessing certain effects. Ecosystem indicators coupled with these individual stock ecosystem evaluations are interpretations aggregated to effects of all groundfish fisheries on the ecosystem.

Determinations of significance of impacts on the ecosystem issues of predator-prey relationships, energy flow and balance, and diversity are made from these individual groundfish stock assessment chapters. At 2004 TAC levels, fisheries within the management areas were predicted to have an insignificant impact on these issues. The alternatives proposed under this action are intended to improve the utility of observer data by improving the ability of NMFS to deploy observers when and where necessary to fill data gaps. Thus, none of the alternatives are expected to have any significant negative impacts on the ecosystem.

3.2.8 Habitat impacts

The marine waters and benthic substrates in the management areas comprise the habitat of all marine species. Additionally the adjacent marine waters outside the EEZ, adjacent State waters inside the EEZ, shoreline, freshwater inflows, and atmosphere above the waters, constitutes habitat for prey species, other life stages, and species that move in and out of, or interact with, the fisheries' target species, marine mammals, seabirds, and the ESA listed species.

Table 3.2-10 Summary of impacts of Alternatives 1-7 on benthic habitat

Summary of Impacts:	*Alt. 1*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*	*Alt. 7*
Removal of or damage to HAPC	I	I	I	I	I	I	I
Modification of nonliving substrate, and/or damage to small epifauna and infauna by fishing gear	I	I	I	I	I	I	I
Change in benthic biodiversity	I	I	I	I	I	I	I

This analysis focuses on the effects of monitoring fishing at the 2004 TAC levels on benthic habitat important to commercial fish species and their prey. The analysis also provides the information necessary for an EFH assessment, which is required by the MSA for any action that may adversely affect EFH. Issues of concern with respect to EFH effects are the potential for damage or removal of fragile biota that are used by fish as habitat, the potential reduction of habitat complexity, which depends on the structural

components of the living and nonliving substrate, and potential reduction in benthic diversity from long-lasting changes to the species mix.

The following criteria are used to rate each alternative as to whether it may have significant effects:

1. Removal of or damage to Habitat Areas of Particular Concern (HAPC) biota by fishing gear
2. Modification of nonliving substrate, and/or damage to small epifauna and infauna by fishing gear
3. Change in benthic biodiversity

The reference point against which the criteria are applied is the current size and quality of marine benthic habitat and other EFH.

Table 3.2-11 Habitat indicators of ecosystem function used in significance determination for Alternatives 1-7 on benthic habitat

Indicator	*Observation*	*Interpretation*
Groundfish bottom trawling effort in GOA	Bottom trawl time in 2001 was similar to 1998-2000 and lower than 1990-1997	Less trawling on bottom
Groundfish bottom trawling effort in EBS	Bottom trawl time in 2001 was similar to 1999 and lower than 1991-1997	Less trawling on bottom relative to 1991-1997
Groundfish bottom trawling effort in AI	About the same in 2001 compared with 2000, generally decreasing trend since 1990	Less trawling on bottom
Area closed to trawling BSAI and GOA	More closed in 2000-2002 compared with 1999	Less trawling on bottom in certain areas though may concentrate trawling in other areas.
HAPC biota bycatch in GOA groundfish fisheries	Estimated at 32t for GOA in 2000	About constant in GOA 1997-2000
HAPC biota bycatch in EBS/AI groundfish fisheries	Estimated at 560t for BSAI in 2000	Lower in BSAI during 2000 relative to 1997-1998

Impacts on EFH. Conducting fisheries in the GOA and BSAI has the potential for benthic disturbances that could result in regional adverse effects on EFH, regardless of the monitoring system employed. Mitigation measures to minimize effects on EFH have been undertaken through ongoing fishery management measures whose principal goals are to protect and rebuild groundfish stocks, but that have also resulted in a benefit to habitat for all managed species. The proposed Federal action to restructure the funding and deployment mechanism of the Observer Program is not anticipated to have additional impacts on EFH beyond those identified in previous analyses discussed above. Therefore, none of the proposed alternatives are expected to have a significant effect on EFH.

3.3 Context and intensity as required by NEPA

To determine the significance of impacts of the actions analyzed in this EA, NMFS is required by NEPA and 50 CFR 1508.27 to consider both the *context* and the *intensity* of the action.

Context: The setting of the proposed action is the groundfish fisheries of the BSAI and GOA. Any effects of the action are limited to these areas. The effects on society within these areas is on individuals directly and indirectly participating in the groundfish fisheries and on those who use the ocean resources. The purpose of the action is to restructure the Observer Program to improve data quality and utility, as well as mitigate disproportionate costs of observer services across various fleets. As a result of collecting more statistically reliable observer data, management of the groundfish fisheries may be improved and this action may have impacts on society as a whole or regionally.

Intensity: Listings of considerations to determine intensity of the impacts are in 50 CFR § 1508.27(b) and in the NOAA Administrative Order 216-6, Section 6. Each consideration is addressed below in the order it appears in the regulations.

1. **Adverse or beneficial impact determinations for marine resources, including sustainability of target and nontarget species, damage to ocean or coastal habitat or EFH, effects on biodiversity and ecosystems, and marine mammals.** Please see Section 3.1 and 3.2 for a discussion of these issues. The proposed Federal action to restructure the funding and deployment mechanism of the Observer Program is not anticipated to have adverse impacts on marine resources. To the extent that more statistically reliable data is collected because NMFS is able to direct observer coverage based on science, management, and data needs, all of the action alternatives could result in a beneficial impact on marine resources. The level of impact of the alternatives will likely vary based on the scope of the fisheries that are included in each alternative.

2. No **public health and safety impacts** were identified in any of the proposed alternatives.

3. This action takes place in the **geographic area** of the GOA (Alternatives 2-7) and potentially, the BSAI (Alternatives 5-7). The action could include only the groundfish vessels in the GOA, or it could also include halibut vessels, GOA-based processors, and various BSAI sectors. There is also an alternative to include all vessels and processors operating in the Federal groundfish or halibut fisheries (Alternative 7). No effects on the unique characteristics of this area are anticipated to occur with any alternative considered because fishing practices and locations are not affected.

4. The effect of this action on the human environment is not **controversial** in the sense that it will not adversely affect the biology of the groundfish or halibut stocks or the TACs established for these species. However, the action may be socially and economically controversial to the current and future participants in the fishery in that differences of opinion exist between components of the fishing industry, observer providers, and observers on issues of cost equity, perceived inequities of observer deployment, potential biases, funding, and observer wages.

5. There are no known **risks to the human environment** associated with eliminating the current pay-as-you-go funding mechanism to a system based on fees and/or Federal subsidies, in which NMFS controls observer deployment. Because the alternatives under consideration address the observer program design, and do not change the catch quotas or fishing practices, it is anticipated that there will be no risk to the human environment by taking this action.

6. This action may represent a decision in principle about **future consideration** of changes to the Observer Program and guide future actions with regard to modifying the Observer Program for other fleets, if any, that are not included in the preferred alternative. Section 1.1.3 discusses the original rationale for limiting the proposed action primarily to the GOA fisheries, as initially, the feasibility of a significant restructuring to the current Observer Program design appeared more

likely if it was limited to the GOA. The intent was to focus the action on those fisheries in which the coverage, data, and disproportionate cost concerns were most acute. However, the problems the action is trying to address are likely present in the BSAI fisheries to a lesser extent, and alternatives were subsequently added to include all fisheries. If the preferred alternative does not include some portion or all of the BSAI fisheries, this action may still guide actions to include those fisheries in the future, upon review of its implementation.

7. The proposed action is not expected to have any significant individual or **cumulative effect** on the environment. The action alternatives under consideration (Alternative 2-7) propose to modify the Observer Program design by changing the funding mechanism to a fee-based and/or Federally subsidized system, as well as allowing NMFS direct control over the deployment of observers. To the extent that Federal managers will receive better data under the proposed program by which to manage the groundfish and halibut fisheries and other marine resources, there may be a beneficial impact to the marine environment.

8. There are no known effects on districts, sites, highways, structures, or objects listed or eligible for listing in the **National Register of Historic Places**, nor would the action cause loss or destruction of any significant scientific, cultural, or historical resources. This consideration is not applicable to this action.

9. NEPA requires NMFS to determine the degree to which an action may affect **threatened or endangered species** under the ESA. There are no known interactions between implementation of the alternatives under consideration and any ESA-listed species in addition to those previously identified in other analyses. This consideration is discussed in Section 3.2.6.

10. This action poses no known violation of Federal, State, or local laws or requirements for the **protection of the environment.** However, statutory authority is likely necessary for any of the proposed action alternatives. This issue is discussed in Section 2.10.

11. **No introduction or spread of non-indigenous species** is expected as a result of this action. This consideration is not applicable to this action.

3.4 Cumulative effects

Cumulative effects are those combined effects on the quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what Federal or non-Federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a), and 1508.25(c)). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The concept behind cumulative effects analysis is to capture the total effect of many actions over time that would be missed by evaluating each action individually.

To avoid the piecemeal assessment of environmental impacts, cumulative effects were included in the 1978 Council on Environmental Quality (CEQ) regulations, which led to the development of the CEQs cumulative effects handbook (CEQ 1997) and Federal agency guidelines based on that handbook (e.g., EPA 1999). Although predictions of direct effects of individual proposed actions tend to be more certain, cumulative effects may have important consequences over the long-term. The goal of identifying potential cumulative effects is to provide for informed decisions that consider the total effects (direct, indirect, and cumulative) of alternative management actions.

There is not expected to be any significant cumulative effect on the groundfish and halibut resource as a result of this action, as none of the alternatives change the groundfish or halibut quotas or general manner, timing, or location in which the fisheries operate. The alternatives under consideration were proposed to mitigate the problems with the existing interim Observer Program related to the quality of observer data and disproportionate costs. The existing program is driven by inflexible coverage levels established in regulation, which make it difficult for NMFS to be responsive to current and future management needs in individual fisheries. Because NMFS cannot effectively deploy observers when and where they are needed to respond to science and management needs or data gaps, there are potential sources of bias that could jeopardize the statistical reliability of observer data. The current program also results in disproportionately high observer costs for some sectors of the fisheries. This action would potentially improve the observer program to the extent that better, more reliable data would be collected by which to manage the identified fisheries. In addition, the program would be funded by a combination of a fee (based on ex-vessel value and/or daily observer costs) and potential Federal subsidies. This action is an attempt to increase the utility and quality of observer data, which, over time, may result in better management of the fisheries off Alaska.

3.5 Benefits of observer coverage

The benefits of observer coverage to the government, industry, and public are substantial. Through observer coverage, NMFS obtains accurate information upon which to base management and conservation decisions, while industry often increases economic opportunities. The public receives unbiased information about the exploitation of a public resource that would otherwise occur outside the pubic view.

3.5.1 General benefits from observer coverage

Commercial fisheries have been managed for over 100 years through landings and catch reports obtained in fishing ports and submitted by fishermen. The question then arises as to whether it is necessary to deploy observers at sea. However, at-sea observers provide data that are unobtainable by just sampling or reporting landings. The following sections describe these data, which are primarily used to support inseason monitoring and management of the fisheries, stock assessments, and research.

Estimates of takes of protected species

Marine mammals and sea birds are protected by a variety of statutes aimed at minimizing potential negative interaction with fisheries and other activities. Chief among these statutes are the Marine Mammal Protection Act and the Endangered Species Act. Observers are necessary to collect data on marine mammal and seabird interactions with the fishing fleet to insure that protected species are not adversely impacted by fishing activity.

Prohibited species catch

Many groundfish fisheries in the North Pacific are limited by bycatch of crab, salmon, halibut, and herring as much if not more so than by the harvest of target species. Observers are currently the only reliable method through which prohibited species catch data can be collected in most North Pacific fisheries. Without observers, the catch of prohibited species could not be managed in an effective manner.

Estimates of discards of fishery resources

Catches brought aboard fishing vessels are mainly sorted for marketable species and sizes, with the unwanted or non-marketable portion of the catch discarded at sea. Discards occur because prohibited or low-valued species are caught along with the marketable species sought. In some fisheries, large catches of undersized commercial species also occur and result in substantial quantities of the species catch being discarded. Accurate stock assessments require that all harvests due to the fishery - either as landings or discards - be measured. Measuring the effects of fishing activities on the ecosystem also requires information on catches of all species, even if they are totally discarded. Observer sampling provides the most reliable method of acquiring data on the quantity and species composition of discards, as well as information on the specific reasons why species are discarded (i.e., too small, no market for the species, fish damaged, etc). With these data, it is possible to more completely understand the effects of fishing and to estimate the potential biological and economic benefits of changes in conservation and management measures (i.e., minimum legal sizes, trip quotas for individual species, etc.).

Biological sampling of the catch

Scientific observers aboard fishing vessels also collect spatially explicit biological samples of the catch. Size and age samples and other observations taken at sea (e.g., sexual maturity) are often not obtainable by sampling dockside landings or if so, samples may be biased towards legal sizes or valuable species. Size and age samples of discards permit the estimation of discard size age composition, which often differs considerably from that in the landings. In most cases, discard of marketable species are of small fish, although damaged legal-sized fish may also be discarded.

Because observer sampling occurs throughout the year, the program affords an opportunity to collect samples of fish gonads and other parts to study seasonal cycles of sexual maturity and growth that may be difficult during annual survey cruises that occur at only one time during the year.

Design and monitoring of conservation gear

Reduction in discards of finfish and protected species has been attempted using a variety of methods, including the development of more selective fishing gear. The development and deployment of such gear requires testing (i.e., to ensure the gear can be safely and efficiently used) and validation (i.e., to ensure this gear is having the intended effect). Observer data can provide important information about the use and effectiveness of fishing gear.

Monitoring of experimental fisheries

Experimental fisheries have frequently occurred in the North Pacific when industry has sought to test fishing gear under controlled conditions, or develop fisheries that conflict with current regulations. Observer data gathered during experimental fisheries provides important data on the effectiveness of the gear or fishing strategy being tested.

Gear performance and characteristics

To support research, scientific observers that are deployed aboard commercial vessels can be requested to make detailed measurements of various attributes of the fishing gear including how it is rigged and deployed. These measurements can be important for two reasons. First, by noting variables of mesh size, number of hooks, gangion length time of trawl tow, etc., in relation to the catch attributes (quantity, species composition, size distribution of catch) it is possible to conduct statistical analyses of the factors that result in high (or low) rates of discard, species mix, changes in catch rate, etc. Second, gear

performance observations, when collected over time, can be used to better calibrate catch-per-unit-effort abundance measures. For example, if the average size of nets, duration of tow, ground-cable length, etc., increases over time, these may have a direct effect on catch per day fished by the fleet (even for same sized vessels). Given sufficient information, these factors can be included in research assessment analyses to provide a more complete and accurate picture of fishing intensity and effectiveness.

Contact with fishermen

Observer programs provide a channel for two-way communication between fishermen and fishery scientists and managers. The program is an important link between NMFS and fishermen. Ideas, complaints and information communicated between observers, captain, and crew are a valuable source of information for all parties.

3.5.2 Benefits from improved observer data under the alternatives

Under the proposed alternatives, the greatest increase in improvement in the collection of observer data is expected in the Tier 3 and Tier 4 fisheries that currently have 30% coverage and no coverage, respectively.

Rreducing sources of bias

Under the existing observer program, vessels required to carry observers 30% of their fishing days choose when and where to carry observers provided that they meet the minimum coverage requirement of 30% of fishing days per quarter and at least one observed fishing trip for each target fishery. Many vessel owners prefer to carry their required coverage later rather than earlier during each quarter for several reasons. First, when vessels carry observers later in the quarter or fishing season they may have a better idea of how many coverage days will actually be needed to meet the regulatory requirement than vessels carrying observers during the start of a fishing season. Therefore, vessels carrying observers later in each quarter or season are better able to avoid exceeding their coverage requirement. Second, some vessel owners may prefer to carry observers later in each quarter so that they can first earn revenues required to pay for observer coverage and other expenses.

The preference for coverage later during each quarter is tempered to some extent by observer providers who have observers under contract and must keep their observers deployed in order to minimize unpaid downtime. Consequently, there is a constant give and take between observer providers and vessel owners in the existing 30% coverage fleet over when and where to carry observer coverage. However, these sorts of coverage decisions are generally driven by the observer provider's desire for efficiency and the vessel owner's desire for predictability, with little or no regard given to scientific or management objectives. This is because NMFS plays no role in deciding when and where to deploy observers in the 30% coverage fleet.

Because catch and bycatch rates fluctuate by season and area, biased decisions about when and where to deploy observers in the 30% coverage fleet has the potential to greatly affect the quality and reliability of observer data.

Under the action alternatives, NMFS would take a lead role in deciding when and where to deploy observers and how much coverage is necessary for each Tier 3 fishery. NMFS would also have the ability to better ‘match’ observers’ skills and experience to the deployment of observers in all fisheries, whether they are less than 100% covered (Tiers 3 and 4) or at least 100% covered (Tiers 1 and 2). For the first time, fishery managers will be able to address these and other known sources of bias, to the benefit of the resulting data.

Targeting coverage to address data needs

A second benefit to a restructured program for Tier 3 and 4 fisheries is the ability of NMFS to target coverage to address specific data needs. Under all of the action alternatives, fishery managers will have the flexibility to adjust coverage as necessary to fill data gaps and address specific conservation or management issues. For example, if questions arise about catch or bycatch by vessels operating in a specific area or time of year, NMFS will have the ability to direct observers onto specific vessels or into specific areas to address those questions. In addition, because NMFS will have greater control over the deployment of specific observers, it will become possible for observers to engage in more specialized data collection or research than is possible today because NMFS will have the opportunity to brief and train observers to conduct more specialized research in advance. These types of specialized projects could include more intensive data collection on specific species or species groups, data collection on gear performance and gear interactions, and more intensive data collection on interactions with marine mammals and other protected species.

Chapter 4 Regulatory Impact Review: Economic Effects of the Alternatives

4.1 Introduction

This Regulatory Impact Review (RIR) evaluates an FMP amendment to establish a new system for procuring and deploying observers in the groundfish and halibut fisheries operating in the North Pacific. Seven alternatives are analyzed. All six of the action alternatives would replace the current pay-as-you-go system, in which vessels contract directly with observer providers to meet observer coverage requirements specified in regulation, for those segments of the fleet that are covered under the alternative. Only one action alternative would replace the current pay-as-you-go system in entirety, for all vessels and processors operating in the North Pacific The new program, in which NMFS would contract directly for observer coverage and would be responsible for determining when and where observers are deployed, would be supported by broad-based user fees and/or Federal funds. Vessels in the new program would no longer be responsible for obtaining their own observer coverage. Those vessels with less than 100% coverage (Tiers 3 and 4) would be required to carry an observer when requested to do so by NMFS. Vessels with 100% or greater coverage requirements would continue to meet coverage levels specified in regulation, but would have their observers provided by NMFS rather than through direct contract with observer providers.

4.1.1 What is a regulatory impact review?

This RIR is required under Presidential Executive Order (E.O.) 12866 (58 FR 51735; October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order: In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant". A "significant regulatory action" is one that is likely to:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

4.1.2 Statutory authority

NMFS manages the Federal groundfish fisheries of the GOA and BSAI under separate FMPs. The North Pacific Fishery Management Council prepared the FMPs pursuant to the MSA. Regulations implementing the FMPs appear at 50 CFR part 679. General regulations that pertain to Federal fisheries appear at subpart H of 50 CFR part 600. While groundfish are managed under the FMPs and the authority of the MSA, halibut is managed by the IPHC as provided by the Convention Between the U.S. and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and the Bering Sea (Convention) and the North Pacific Halibut Act of 1982 (Halibut Act). However, the Halibut Act and the Convention have been interpreted to assign responsibility to the Council on halibut management issues. Thus, the Council is authorized to amend the Federal regulations governing both halibut and groundfish under existing law. The proposed action is therefore both a Gulf groundfish FMP amendment, and potentially a BSAI groundfish FMP amendment, depending on the scope of the program in the preferred alternative. In addition, this action would represent a regulatory amendment for groundfish, and potentially halibut, depending on the alternative selected.

4.1.3 Purpose and need for action

During the development of the 2002 regulations to extend the interim Observer Program, the Council and NMFS both recognized that a more comprehensive restructuring of the program was necessary to solve many of the problems inherent in the current "pay-as-you-go" approach. At its October 2002 meeting, the Council tasked its OAC to develop a problem statement and alternatives for restructuring the Observer Program, to be presented at the February Council meeting. In order to facilitate further progress by the committee, NMFS developed a discussion paper which included a general discussion of issues and alternatives related to the restructuring of the Observer Program. The OAC met January 23-24, 2003, with the primary purpose of reviewing this paper, drafting a problem statement, and providing recommendations to the Council. At its February meeting, the Council reviewed the discussion paper and the draft OAC report and approved the following problem statement for restructuring the Observer Program:

> *The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives.*

The Council reviewed a preliminary draft analysis in December 2003 which only considered alternatives to change the structure of the Observer Program for the fisheries in the Gulf of Alaska. However, also in December, the Council received a report from NMFS detailing potential issues of concern related to

observer certification/decertification and the application of a new NMFS policy which defines wage rates and overtime requirements for observers under service delivery models that include direct contracts between NMFS and observer providers. NMFS requested additional time to address these issues, in order to determine whether the agency could support a hybrid program in which some vessels (primarily BSAI vessels) would operate under the current pay-as-you-go model and the remaining vessels (primarily GOA vessels) would operate under the new contract system. NMFS was concerned about several issues that would arise under such a hybrid program, specifically that two different procedures would exist for addressing observer performance and conduct problems in the BSAI and the GOA fisheries, and the potential differences in observer remuneration between the two systems. This potential difference in observer wages could create shortages in observers between the two areas and lead to differences in data quality. Additionally, managing a hybrid system would create a larger administrative burden for the Observer Program.

At the February 2004 Council meeting, NMFS provided a letter to the Council stating that the agency had determined that effective procedures for addressing observer performance and data quality issues can only be put in place through a service delivery model that provides direct contractual arrangements between NMFS and the observer providers. NMFS thus recommended that the Council include an additional alternative to the draft analysis that would apply the proposed direct contract model program-wide, so that all observer services in both the BSAI and the GOA would be provided by observer companies that have direct contracts with NMFS.

Upon review of the NMFS letter, the Council tasked the OAC at its next meeting to explore new alternatives that address the issue of combining the BSAI and the GOA as one comprehensive observer program, including the concept of a direct NMFS contract with observer providers. At the OAC's March 11-12 2004 meeting, the committee addressed the major issues requested by the Council, with the understanding that further information on observer compensation issues and the cost implications of NMFS' recent policy were necessary (and at the time, unavailable) to understand the impacts of any of the existing or new alternatives. The primary recommendations of the committee, detailed in the OAC report, included the addition of two new alternatives (and suboptions) for analysis which included specific BSAI fleets that may also experience disproportionately high observer costs or have modes of operation that would make it difficult to retain observer services under two different programs in the BSAI and GOA. **However, the committee did not recommend including a program-wide alternative for all BSAI and GOA vessels and processors.**

The Council reviewed the OAC recommendations at its April 2004 meeting, as well as another letter from NMFS that was submitted to the Council in late March. This letter reiterated NMFS's concerns with having two separate programs in the BSAI and the GOA, and again recommended a program-wide alternative for analysis. The Council ultimately approved both of the OAC's newly proposed alternatives and the program-wide alternative recommended by NMFS. **The result is that the Council expanded the suite of alternatives to include the major fisheries of the BSAI.**

In June 2004, the Council also provided options to consider alternative types of fees for analysis (other than a fee based on ex-vessel value), specifically for the alternatives that include the major fisheries of the BSAI. Many of the BSAI fisheries require individual vessel or cooperative level monitoring, and thus require 100% or greater observer coverage as mandated by law or by the provisions of a specific management program. For these fisheries, the Council determined it would be appropriate to analyze a type of fee which can exactly match the costs of observer coverage, and thus avoid the potential for reducing coverage levels to respond to revenue shortfalls. **Thus, in June 2004, the Council approved options to consider a daily observer fee for those BSAI fisheries that have 100% or greater coverage requirements for their specific management programs. These options were incorporated to create the existing suite of alternatives and options under consideration in this document.**

4.1.4 Description of the alternatives

The alternatives and program elements analyzed in this document are described in detail in Chapter 2. The six action alternatives are distinguished primarily in terms of scope (i.e. which vessels and processors would be included in the program) and by the structure of the fee collection program. The alternatives under consideration are the following:

Alternative 1. ***No action alternative***. Under this alternative, the current interim "pay-as-you-go" program would continue to be the only system under which groundfish observers would be provided in the groundfish fisheries of the BSAI and GOA. Regulations authorizing the current program expire at the end of 2007, meaning that no action is not a viable alternative over the long-term.

Alternative 2. ***GOA groundfish vessels only.*** Under this alternative, a new fee-based program would be established for GOA groundfish vessels, including GOA groundfish vessels under 60'. Regulations that divide the fleet into 0%, 30%, and 100% coverage categories would no longer apply to vessels in the program, and vessel operators would no longer be responsible for obtaining their own observer coverage. Under the new program, NMFS would determine when and where to deploy observers based on data collection and monitoring needs and would contract directly for observers using fee proceeds and/or direct Federal funding. Vessels would only be required to carry an observer when one is provided by NMFS. The fee would be based on a percentage of the ex-vessel value of each vessel's GOA groundfish landings and would be collected through annual billing by NMFS.

Alternative 3. ***GOA groundfish vessels and halibut vessels only.*** This expands on Alternative 2 by including halibut vessels from all areas off Alaska. Fees would be collected from halibut landings as well as groundfish landings through annual billing by NMFS, and NMFS would have the authority to place observers on halibut vessels as well as groundfish vessels.

Alternative 4. ***GOA groundfish vessels, halibut vessels and GOA-based groundfish processors.*** This alternative expands on Alternative 3 by including GOA-based groundfish processors. However, in contrast to Alternatives 2 and 3, fees would be collected by processors at the time of landing, and fee proceeds would be submitted to NMFS on a quarterly basis.

Alternative 5. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, BSAI fixed gear CVs, jig vessels, and BSAI pot vessels.*** This alternative expands on Alternative 4 by including BSAI longline, pot, and jig CVs and BSAI pot CPs.

Alternative 6. ***GOA groundfish vessels, halibut vessels, GOA-based groundfish processors, all BSAI groundfish vessels under 125', and all BSAI pot vessels.*** This alternative expands on Alternative 5 by adding BSAI trawl CVs under 125', and BSAI trawl and longline CPs under 125'. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

Option 1: **Include longline CPs ≥125'**. This suboption would expand Alternative 6 by including longline CPs ≥125' operating in the BSAI.

Option 2: **Include non-AFA (H&G) trawl CPs ≥**125'. This suboption would expand Alternative 6 by including non-AFA trawl CPs ≥125'.

Option 3: I**nclude BSAI trawl CVs ≥125'**. (Staff recommend inclusion of this option). Adding this option would allow all CVs operating in the BSAI to be covered under a single uniform program. Without this option, the predominantly AFA CV fleet operating in the BSAI would be split between two separate observer programs for vessels <125' and ≥125' despite the fact that the two classes of vessels would in many cases be fishing side-by-side and delivering to the same processors.

Alternative 7. ***Comprehensive alternative. All groundfish vessels and processors and all halibut vessels.*** This alternative would establish a new fee-based Observer Program in which NMFS has a direct contract with observer providers for all GOA and BSAI groundfish and halibut fisheries. Under this alternative, vessels with 100% or greater coverage requirements would pay a daily observer fee and vessels with coverage requirements less than 100% would pay an ex-vessel value fee.

In developing the alternatives, the Council also included several options that apply to more than one alternative. The following options affecting the scope of the program may be applied to more than one alternative:

Option 4: **Exclude GOA-based inshore processors**. (Alternatives 5 and 6). This option would exclude GOA-based inshore processors from the program under Alternatives 5 and 6. The effect of the alternative would be to establish a vessel-only program for the covered fisheries in the GOA and BSAI.

Option 5: **Establish an opt-in, opt-out provision for BSAI-based inshore processors**. (Alternatives 4 through 6). This option applies only if Option 4 is rejected. This option would allow each BSAI-based processor to determine for itself whether to opt-in or opt-out of the program. Processors opting into the program would pay observer fees on all groundfish and halibut landings they receive and would receive their observer coverage through the program. Processors electing to opt-out would pay observer fees on only those landings received from vessels that are participating in the program and would pay no fees on landings from vessels that are not participating in the program. The rationale behind this option is to provide certain BSAI-based processors with the option to join the program should they find that the majority of their landings are from vessels covered by the program. Each BSAI-based processor would have the opportunity to decide whether it makes sense to participate in the program based on how many of its deliveries are from vessels covered by the program.

Option 6: **Include CDQ fishing for participating vessels** (Alternatives 5 and 6). Under this option, vessels that participate in the program when fishing in non-CDQ fisheries would continue to be included in the program when fishing CDQ. This option would allow vessel operators to obtain their coverage through a single program throughout the fishing year and would allow them to switch back and forth between CDQ and non-CDQ fisheries without changing observers. Without this option, vessel operators could be forced to switch observers and observer providers when switching between CDQ and non-CDQ fishing and would be obligated to pay two separate types of fees depending upon whether the vessel is fishing CDQ or non-CDQ.

An additional option applies to the type of fee program selected.

Option 7: **Uniform fee program.** (Alternatives 6 and 7) Under this option, a uniform ex-vessel value fee would be required for all vessels and processors covered by the program in place of the two separate fee programs that are contained in Alternatives 6 and 7. Adoption of this option in conjunction with Alternative 7 would establish a program similar to the Research Plan that was implemented in 1994 and repealed in 1995.

Finally NMFS recommends inclusion of an option to address the expiration of the existing program for fisheries not covered under the preferred alternative.

Option 8: **Remove 2007 expiration date for no-action fisheries.** Under this option, the December 31, 2007 expiration date for the current program would be removed. This means that under Alternatives 2 through 6, the Council's preferred alternative would establish two permanent programs: (1) a new program for those vessels or fisheries covered by the program, and, (2) the permanent extension of the existing program for fisheries not covered by the new program. The purpose of this option is to eliminate the need to immediately begin analysis of an extension of the existing program for fisheries that are not covered by the preferred alternative, should the Council choose an alternative other than Alternative 7.

4.2 Description of the fishery

The different classes of groundfish fishing and processing operations that might be affected by these regulations are described in detail in Section 3.9 (Social and Economic Conditions) of the Final PSEIS (NMFS, 2004). Section 3.9.2 provides extremely detailed fishing and processing sector profiles. Readers interested in additional detail are referred to the Final PSEIS.

In addition to affecting the groundfish and halibut fishing industry, the alternatives and options considered in this document would affect the current and future observer providers and observers.

Tables 4.2-1 and 4.2-2 show the number of vessels and processors that participated in GOA and BSAI groundfish and halibut fisheries from 2000-2003 for each vessel class and permit type (groundfish, halibut, or both). Tables 4.2-3 and 4.2-4 summarize information about the numbers of groundfish and halibut fishing operations affected by the alternatives in the GOA and BSAI, respectively. As noted above, all of the alternatives and options would directly affect observer provider companies and observers that operate in fisheries covered by the program restructuring alternatives.

Table 4.2-1 Participation in GOA groundfish and halibut fisheries by vessel/processor class and year, 2000-2003

Sector	Permit Type	Vessel Class	Year				2000-2003 Average
			2000	2001	2002	2003	
CP	Groundfish	Longline CP <125	13	10	10	8	10
		Longline CP ≥125	8	8	11	14	10
		Pot CP <125	1	1	2	1	1
		Pot CP ≥125	3	1	2		2
		Trawl CP <125	4	6	4	7	5
		Trawl CP ≥125	14	12	12	14	13
	Halibut	Longline CP <125	150	128	135	157	143
		Longline CP ≥125			1	1	1
CV	Groundfish & Halibut	AFA Diversified Trawl	4	3	3	3	3
		AFA Trawl 60-124	1	1	1	1	1
		Fixed Gear <32	37	37	31	38	36
		Fixed Gear 33-59	475	423	380	377	414
		Longline ≥60	59	56	59	56	58
		Non-AFA Trawl <60	22	22	21	19	21
		Non-AFA Trawl ≥60	14	13	14	14	14
		Pot ≥60	31	24	22	21	25
	Groundfish only	AFA Diversified Trawl	17	19	18	18	18
		AFA Trawl ≥125	2		2	2	2
		AFA Trawl 60-124	8	12	6	7	8
		Fixed Gear <32	63	48	30	43	46
		Fixed Gear 33-59	213	179	161	176	182
		Longline ≥60	11	7	8	9	9
		Non-AFA Trawl <60	24	23	24	23	24
		Non-AFA Trawl ≥60	20	22	18	17	19
		Pot ≥60	72	23	21	21	34
	Halibut only	Fixed Gear <32	341	299	297	302	310
		Fixed Gear 33-59	489	484	472	439	471
		Longline ≥60	10	14	10	13	12
		Pot ≥60	1	7	7	7	6
Processors	All	AFA inshore	5	5	5	5	5
		Aleutian Islands	5	5	3	3	4
		Kodiak	15	14	12	10	13
		Southcentral	13	11	11	9	11
		Southeast	10	11	10	9	10
		Floater	8	1	3	2	4
		Mothership		1	1	1	1
		Other Bering Sea		1			0
Total			**2,163**	**1,931**	**1,827**	**1,847**	**1,946**

Source: NMFS Alaska Region BLEND data and ADF&G fish ticket data.
Note: Jig gear is included in fixed gear numbers.

Table 4.2-2 Participation in BSAI groundfish and halibut fisheries by vessel/processor class and year, 2000-2003

Sector	Permit Type	Vessel Class	Year				2000-2003 Average
			2000	2001	2002	2003	
CP	Groundfish	AFA CP ≥125	15	16	17	17	16
		Longline CP <125	13	13	10	10	12
		Longline CP ≥125	27	30	30	29	29
		Pot CP <125		2	2	2	2
		Pot CP ≥125	8	5	3	1	4
		Trawl CP <125	8	7	7	7	7
		Trawl CP ≥125	15	15	15	15	15
	Halibut	Longline CP <125	5	6	8	8	7
		Longline CP ≥125		1	1	2	1
CV	Groundfish & Halibut	AFA Diversified Trawl		3	3	3	2
		AFA Trawl 60-124	1	1	1	1	1
		Fixed Gear <32	13	15	9	12	12
		Fixed Gear 33-59	47	58	48	50	51
		Longline ≥60	33	32	30	28	31
		Non-AFA Trawl <60	4	2	2	5	3
		Non-AFA Trawl ≥60	4	1	3	2	3
		Pot ≥60	14	13	14	14	14
	Groundfish only	AFA Diversified Trawl	23	25	26	26	25
		AFA Trawl ≥125	30	29	28	28	29
		AFA Trawl 60-124	44	45	41	41	43
		Fixed Gear <32	9	9	6	7	8
		Fixed Gear 33-59	9	16	16	13	14
		Longline ≥60	1		1		1
		Non-AFA Trawl <60		6	8	12	7
		Non-AFA Trawl ≥60	7	4	6	6	6
		Pot ≥60	97	63	45	60	66
	Halibut only	Fixed Gear <32	262	244	243	243	248
		Fixed Gear 33-59	8	11	15	11	11
		Longline ≥60	4	6	4	6	5
		Pot ≥60	1	3	4	6	4
Processors	All	AFA inshore	6	6	6	6	6
		Aleutian Islands	7	7	7	6	7
		Kodiak	9	8	10	6	8
		Southcentral	3	4	4	4	4
		Southeast	1	2	1	2	2
		Floater	7	3	2	3	4
		Mothership	3	3	3	4	3
		Other Bering Sea	3	2	2	2	2
Total			**741**	**716**	**681**	**698**	**713**

Source: NMFS Alaska Region BLEND data and ADF&G fish ticket data.
Note: Jig gear is included in fixed gear numbers.

Table 4.2-3 Estimated number of entities in the GOA in 2003 that would be affected by each of the alternatives

Sector	*Permit Type*	*Vessel Class*	*Alt. 2*	*Alt. 3*	*Alt. 4*	*Alt. 5*	*Alt. 6*				*Alt. 7*
							No Opt.	*Opt. 1*	*Opt.2*	*Opt. 3*	
CP	Groundfish	Longline CP <125	8	8	8	8	8	8	8	8	8
		Longline CP ≥125	14	14	14	14	14	14	14	14	14
		Pot CP <125	1	1	1	1	1	1	1	1	1
		Trawl CP <125	7	7	7	7	7	7	7	7	7
		Trawl CP ≥125	14	14	14	14	14	14	14	14	14
	Halibut	Longline CP <125		157	157	157	157	157	157	157	157
		Longline CP ≥125		1	1	1	1	1	1	1	1
CV	Groundfish & Halibut	AFA Diversified Trawl	3	3	3	3	3	3	3	3	3
		AFA Trawl 60-124	1	1	1	1	1	1	1	1	1
		Fixed Gear <32	38	38	38	38	38	38	38	38	38
		Fixed Gear 33-59	377	377	377	377	377	377	377	377	377
		Longline ≥60	56	56	56	56	56	56	56	56	56
		Non-AFA Trawl <60	19	19	19	19	19	19	19	19	19
		Non-AFA Trawl ≥60	14	14	14	14	14	14	14	14	14
		Pot ≥60	21	21	21	21	21	21	21	21	21
	Groundfish only	AFA Diversified Trawl	18	18	18	18	18	18	18	18	18
		AFA Trawl ≥125	2	2	2	2	2	2	2	2	2
		AFA Trawl 60-124	7	7	7	7	7	7	7	7	7
		Fixed Gear <32	43	43	43	43	43	43	43	43	43
		Fixed Gear 33-59	176	176	176	176	176	176	176	176	176
		Longline ≥60	9	9	9	9	9	9	9	9	9
		Non-AFA Trawl <60	23	23	23	23	23	23	23	23	23
		Non-AFA Trawl ≥60	17	17	17	17	17	17	17	17	17
		Pot ≥60	21	21	21	21	21	21	21	21	21
	Halibut only	Fixed Gear <32		302	302	302	302	302	302	302	302
		Fixed Gear 33-59		439	439	439	439	439	439	439	439
		Longline ≥60		13	13	13	13	13	13	13	13
		Pot ≥60		7	7	7	7	7	7	7	7
Processors	All	AFA inshore			5	5	5	5	5	5	5
		Aleutian Islands			3	3	3	3	3	3	3
		Floater			2	2	2	2	2	2	2
		Kodiak			10	10	10	10	10	10	10
		Mothership			1	1	1	1	1	1	1
		Southcentral			9	9	9	9	9	9	9
		Southeast			9	9	9	9	9	9	9
GOA Total			**889**	**1808**	**1847**	**1847**	**1847**	**1847**	**1847**	**1847**	**1847**

Source: NMFS Alaska Region BLEND data and ADF&G fish ticket data.
Note: Jig gear is included in fixed gear numbers.

Table 4.2-4 Estimated number of entities in the BSAI in 2003 that would be affected by each of the alternatives

Sector	Permit Type	Vessel Class	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6				Alt. 7
							no Opt.	Opt. 1	Opt. 2	Opt. 3	
CP	Groundfish	AFA CP ≥125									17
		Longline CP <125					11	11	11	11	11
		Longline CP ≥125						29			29
		Pot CP <125				2	2	2	2	2	2
		Pot CP ≥125				1	1	1	1	1	1
		Trawl CP <125					7	7	7	7	7
		Trawl CP ≥125							15		15
	Halibut	Longline CP <125		8	8	8	8	8	8	8	8
		Longline CP ≥125		2	2	2	2	2	2	2	2
CV	Groundfish & Halibut	AFA Diversified Trawl				3	3	3	3	3	3
		AFA Trawl 60-124				1	1	1	1	1	1
		Fixed Gear <32				12	12	12	12	12	12
		Fixed Gear 33-59				50	50	50	50	50	50
		Longline ≥60				28	28	28	28	28	28
		Non-AFA Trawl <60				5	5	5	5	5	5
		Non-AFA Trawl ≥60				2	2	2	2	2	2
		Pot ≥60				14	14	14	14	14	14
	Groundfish only	AFA Diversified Trawl				26	26	26	26	26	26
		AFA Trawl ≥125								28	28
		AFA Trawl 60-124				41	41	41	41	41	41
		Fixed Gear <32				7	7	7	7	7	7
		Fixed Gear 33-59				13	13	13	13	13	13
		Non-AFA Trawl <60				12	12	12	12	12	12
		Non-AFA Trawl ≥60				6	6	6	6	6	6
		Pot ≥60				60	60	60	60	60	60
	Halibut only	Fixed Gear <32		243	243	243	243	243	243	243	243
		Fixed Gear 33-59		11	11	11	11	11	11	11	11
		Longline ≥60		6	6	6	6	6	6	6	6
		Pot ≥60		6	6	6	6	6	6	6	6
Processors	All	AFA inshore									6
		Aleutian Islands									6
		Floater									3
		Kodiak									6
		Mothership									4
		Other Bering Sea									2
		Southcentral									4
		Southeast									2
Total				**276**	**276**	**559**	**577**	**606**	**592**	**605**	**699**

Source: NMFS Alaska Region BLEND data and ADF&G fish ticket data.
Note: Jig gear is included in fixed gear numbers.

The following sections provide a short summary of each type of vessel and processor listed in Tables 4.2-1 through 4.43.

4.2.1 Catcher processors (CPs)

CPs carry the equipment and personnel they need to process the fish that they themselves catch. In some cases CPs also process fish harvested for them by CVs and transferred to them at sea. There are many types of CPs. The largest CPs are the AFA pollock CPs that operate exclusively in the BSAI because sideboard limitations contained in the AFA prohibit such vessels from fishing for groundfish in the GOA. AFA CPs would only be included in Alternative 7. The remaining types of CPs that may be affected by some or all of the alternatives are summarized below.

Trawl Head And Gut (H&G) CPs. These vessels are generally limited to headed and gutted products or kirimi and operate primarily in the BSAI, although some also fish in the GOA. In general, trawl H&G CPs focus their efforts on flatfish, Pacific cod, and Atka mackerel. Trawl H&G CPs are generally smaller than AFA CPs and operate for longer periods than the surimi and fillet CP vessels that focus on pollock. A fishing rotation in this sector might include Atka mackerel in January; rock sole in February; rock sole, Pacific cod, and flatfish in March; rex sole in April; yellowfin sole and turbot in May; yellowfin sole in June; rockfish in July; and yellowfin sole and some Atka mackerel from August to December. The target fisheries of this sector are usually limited by bycatch regulations or by market constraints and only rarely are able to catch the entire TAC of the target fisheries available to them. Trawl H&G CPs that fish in the GOA would be affected by Alternatives 2 through 7. Trawl H&G CPs that limit their operations to the BSAI would be affected by Alternatives 6 and 7.

Pot CPs. These vessels have been used primarily in the crab fisheries of the North Pacific, but increasingly are participating in the Pacific cod fisheries. They generally use pot gear, but may also use longline gear. They produce whole or headed and gutted groundfish products, some of which may be frozen in brine rather than blast frozen. Vessels in the pot CP sector predominantly use pot gear to harvest BSAI and GOA groundfish resources. The crab fisheries in the BSAI are the primary fisheries for vessels in the sector. Groundfish harvest and production are typically secondary activities. Vessels average about 135' LOA and are equipped with deck cranes for moving crab pots. Most pot vessel owners use their pot gear for harvesting groundfish. However, some owners change gear and participate in longline fisheries. Pot CPs $\geq$125' are subject to somewhat different observer requirements than other large CPs; all pot vessels $\geq$60' are only required to have coverage on 30% of their pots pulled for that calendar quarter as opposed to the 100% of the fishing days coverage required on other vessels over 125'. Therefore all pot CPs would be affected by Alternatives 5 through 7, and those fishing for groundfish in the GOA would also be affected by Alternatives 2 through 4.

Longline CPs. These vessels, also known as freezer longliners, use longline gear to harvest groundfish. Most longline CPs are limited to headed and gutted products, and in general are smaller than trawl H&G CPs. The longline CP sector evolved because regulations applying to this gear type provide more fishing days than are available to other gear types. Longline CP vessels are able to produce relatively high-value products that compensate for the relatively low catch volumes associated with longline gear. These vessels average just over 130' LOA. On average over 2000-2003, there were 42 vessels operating in this sector in the BSAI. These vessels target Pacific cod, with sablefish and certain species of flatfish (especially Greenland turbot) as important secondary target species. Many vessels reported harvesting all four groundfish species groups each year from 1991 through 1999. Most harvesting activity has occurred in the BSAI, but a few longline CP vessels operate in both the BSAI and GOA. Those vessels fishing in the GOA would be affected by all of the alternatives. Longline CPs operating exclusively in the BSAI could be affected by Alternatives 5 through 7.

4.2.2 Motherships

Motherships are defined as vessels that process, but do not harvest, fish. The three motherships currently eligible to participate in the BSAI pollock fishery range in length from 305' to 688' LOA. Motherships contract with a fleet of CVs that deliver raw fish to them. As of June 2000, 20 CVs were permitted to make BSAI pollock deliveries to these motherships. Substantial harvesting and processing power exists in this sector, but it is not as great as either the inshore or CP sectors. Motherships are dependent on BSAI pollock for most of their income, though small amounts of income are also derived from the Pacific cod and flatfish fisheries. In 1999, over 99% of the total groundfish delivered to motherships was pollock from the BSAI. About $30 million worth of surimi, $6 million of roe, and $3 million of meal and other products were produced from that fish. These figures exclude any additional income generated from the whiting fishery off the Oregon and Washington coasts in the summer.[14] Only one of the three motherships participated in the GOA during 1999, and GOA participation in previous years was also sporadic. This is likely due to the inshore/offshore and AFA sideboard restrictions, which allocate 100% of the GOA pollock to the inshore processing component. To the extent that these motherships process groundfish harvested in the GOA, they would be affected by Alternatives 4 and 5. Motherships operating exclusively in the BSAI would be affected by Alternatives 5 through 7.

4.2.3 Groundfish catcher vessels (CVs)

CVs harvest fish, but are not themselves equipped to process it. They deliver their product at sea to a mothership or CP, or to an inshore processor. There are a wide variety of CVs, distinguished in this section by product and gear type.

AFA-qualified trawl CVs. Vessels harvesting BSAI pollock deliver their catch to shoreside processing plants in western Alaska, large floating (mothership) processors, and to the offshore CP fleet. Referred to as CVs, these vessels comprise a relatively homogenous group, most of which are long-time, consistent participants in a variety of BSAI fisheries, including pollock, Pacific cod, and crab, as well as GOA fisheries for pollock and cod. There are 107 eligible trawl vessels in this sector, and they range from under 60' to 193', though most of the vessels fishing BSAI pollock are from 70-130'. Ninety AFA CVs are equal to or greater than 60 ft, requiring either 30% or 100% observer coverage. The AFA established, through minimum recent landings criteria, the list of trawl CVs eligible to participate in the BSAI pollock fisheries. There is significant, and recently increasing, ownership of this fleet (about a third) by onshore processing plants. Those AFA CVs that fish in the GOA would be affected by Alternatives 2 through 7 Those AFA CVs less than 125' LOA that fish in the BSAI would also be affected by Alternatives 5 through 7.

Non-AFA trawl CVs $\geq$60' LOA. Includes all CVs greater than or equal to 60' LOA that used trawl gear for the majority of their catch but are not qualified to fish for pollock under the AFA. They are ineligible to participate in Alaska commercial salmon fisheries with seine gear because they are longer than 60'. Vessels must have harvested a minimum of 5 mt of groundfish in a year to be considered part of this class. The revenue from five mt of Pacific cod at $0.20 per pound is about $2,200. Non-AFA trawl CVs greater than or equal to 60' also tend to concentrate their efforts on groundfish, obtaining more than 80% of ex-vessel revenue from groundfish harvests. Most, if not all of these vessels are less than 125' LOA and most concentrate their fishing in the GOA. Only 3 non-AFA trawl CVs over 60' LOA fish for groundfish in the BSAI on a regular basis. All of the non-AFA trawl CVs would be affected by Alternatives 2 through 7.

[14] In 1996, whiting accounted for about 12% of mothership total revenue.

*Pot CV*s. These vessels rely on pot gear for participation in both crab and groundfish fisheries. All vessels included in this class are qualified to participate in the crab fisheries under the Crab License Limitation Program. Some of these vessels use longline gear in groundfish fisheries. Vessels in this class are typically equipped with one or two large deck cranes for moving and stacking crab pots and a steel-framed pot launcher. These vessels have an average length of about 100', an average rating of about 175 gross tons, and an average horsepower rating of about 800. Historically, the pot fishery in Alaska waters produced crab. Several factors, including diminished king and tanner crab stocks, led crabbers to begin to harvest Pacific cod with pots in the 1990s. The feasibility of fishing BSAI Pacific cod with pots was also greatly enhanced with the implementation of Amendment 24 to the BSAI FMP, which allocated the target fishery between trawl and fixed gear vessels.[15] All pot CVs that fish in the GOA would be affected by Alternatives 2 through 7. All pot vessels that fish in the BSAI would be affected by Alternatives 5- 7.

Hook-and-line CV ≥60'. A large majority of the longline CVs in this class operate solely with longline fixed gear, focusing on halibut and relatively high-value groundfish such as sablefish and rockfish. Both fisheries generate high revenue per ton, and these vessels often enter other high-value fisheries such as the albacore fisheries on the high seas. The reliance of these vessels on groundfish fisheries sets them apart from smaller fixed gear CVs permitted to operate in Alaska salmon fisheries with multiple gear types. Overall, this fleet is quite diverse. Excluding vessels that principally participate in the halibut or salmon fishery, most vessels are between 60 and 80' long with an average length of about 70'. The larger vessels in this class can operate in the Bering Sea during most weather conditions, while smaller vessels can have trouble operating during adverse weather. All hook-and-line CVs ≥60' LOA that fish in the GOA would be affected by Alternatives 2 through 7. CVs ≥60' that fish in the BSAI would be affected by Alternatives 5 through 7.

CVs <60' LOA (all gear types). This CV class primarily uses trawl and longline gear although a few vessels also use pot gear. This group of vessels is allowed to participate in the State of Alaska commercial seine fisheries for salmon. Alaska's limited entry program for salmon fisheries established a 58-foot length limit for seine vessels entering these fisheries after 1976. Many groundfish CVs less than 60 ft in length were built to be salmon purse seine vessels, while others were designed to function as both trawlers and seiners. Within this class, vessels using trawl gear tend to have larger engines, more electronics, larger fish holds, and the necessary deck gear and nets to operate in the trawl fisheries. Similar-sized fixed gear vessels that participate in commercial salmon fisheries with purse seine gear have not made the necessary investment to participate in the trawl fisheries. There are far more vessels in this class using fixed gear than trawl gear. The feasibility of fishing BSAI Pacific cod with CVs <60' LOA was enhanced with the implementation of BSAI Amendment 64 in 2000, in which this sector received a direct allocation of BSAI Pacific cod. This allocation was extended in 2004 with the implementation of BSAI Amendment 77. All CVs <60' that fish in the GOA would be affected by Alternatives 2 through 7. CVs <60' that fish in the BSAI would be affected by Alternatives 5 through 7.

An additional large group of CVs is less than or equal to 32' LOA. A length of 32 ft is the maximum for the Bristol Bay salmon drift gillnet fishery, and vessels in this fishery typically are built to this size limit. A large number of vessels of this size have been built for the Bristol Bay fishery and other salmon fisheries in Alaska. Similar size restrictions do not apply to other salmon management areas in the state. Vessels in this class typically were designed for salmon fisheries. The vessels may use a mix of longline, jig, and sometimes pot gear to harvest halibut and groundfish before or after the salmon season. Most vessels in the under 60' length class participate in groundfish fisheries to augment their earnings from

[15] Amendment 64 to the BSAI FMP further allocated the fixed gear BSAI Pacific cod fishery between the hook-and-line and pot sectors of the fixed gear fleets. Most recently, the Council approved BSAI Amendment 77 in June 2003, which, among other actions, establishes separate BSAI Pacific cod allocations for the pot CP and pot CV sectors. This amendment was effective on January 1, 2004.

Alaska salmon fisheries. These vessels obtain most of their groundfish revenues from harvests of Pacific cod, sablefish, and rockfish.

Halibut fishing vessels. Only hook-and-line gear can be used in the halibut fishery and the vast majority of the halibut catch is taken with longline gear. Participation in this fishery is controlled by the regulations for the halibut IFQ program and the halibut CDQ program. The IFQ program allows very limited participation in the halibut fishery by freezer longline vessels. Halibut CVs principally deliver their catch to inshore processors. However, a small part of the halibut catch is sold directly to restaurants, retail outlets, or the final consumers. Many of the longline fishing vessels operate solely with longline fixed gear, focusing on halibut and relatively high-value groundfish such as sablefish and rockfish. These two groundfish fisheries and the halibut fishery generate high revenue per ton, and these vessels often enter other high-value fisheries such as the albacore fisheries on the high seas. The reliance of these vessels on the halibut and groundfish fisheries sets them apart from smaller fixed gear CVs permitted to operate in Alaska salmon fisheries with multiple gear types. Overall, this fleet is quite diverse. Approximately 90% of halibut vessels are less than 60' and 70% also participate in at least one groundfish fishery. Halibut vessels that also fish groundfish would be affected by Alternatives 2 through 7. Halibut vessels that do not also fish for groundfish would be affected by Alternatives 3 through 7.

4.2.4 Shoreside processors

AFA inshore processors. There are six shoreside and two floating processors eligible to participate in the inshore sector of the BSAI pollock fishery. Three AFA shoreside processors are located in Dutch Harbor/Unalaska. The communities of Akutan, Sand Point, and King Cove are each home to one AFA shoreside processor. The shoreside processors produce primarily surimi, fillets, roe, meal, and a minced product from pollock. Other products such as oil are also produced by these plants but they account for relatively minor amounts of the overall production and revenue. These plants process a variety of species including other groundfish, halibut, and crab, but have historically processed very little salmon. In total, the inshore processors can take BSAI pollock deliveries from a maximum of 97 CVs, as of June 2000, according to the regulations implemented by the AFA. The two floating processors in the inshore sector are required to operate in a single BSAI location each year, and they usually anchor in Beaver Inlet in Unalaska. However, one floating processor has relocated to Akutan. The two floating inshore processors have historically produced primarily fillets, roe, meal, and minced products. Those AFA inshore processors that receive groundfish harvested in the GOA would be affected by Alternatives 4 through 7, and those that only process groundfish harvested in the BSAI would be affected by Alternatives 5-7.

Non-AFA inshore processors. Non-AFA inshore plants include shore-based plants that process Alaska groundfish and several floating processors that moor near shore in protected bays and harbors. This group includes plants engaged in primary processing of groundfish and does not include plants engaged in secondary manufacturing, such as converting surimi into analog products such as imitation crab, or further processing of other groundfish products into ready-to-cook products. Those shoreside processors that process groundfish harvested in the GOA would be affected by Alternatives 4 through 7, and all non-AFA inshore processors could potentially be affected by Alternatives 5 through 7. Four groups of non-AFA inshore processors are described below. The groupings are primarily based on the regional location of the facilities: (1) Alaska Peninsula and Aleutian Islands, (2) Kodiak Island, (3) Southcentral Alaska, and (4) Southeast Alaska. Information provided in the narratives below includes all inshore processors for each area collectively, and does not differentiate between size classes or coverage levels.

Alaska Peninsula and Aleutian Islands inshore plants. In 1999, ten Alaska Peninsula and Aleutian Islands plants participated in the groundfish fishery. Between 1991 and 1999, almost all of the facilities reported receiving fish every year from the BSAI. In 1999, these facilities processed 66,635 mt round

weight, of which 43,646 mt (66%) was pollock and 19,402 mt (30%) was Pacific cod. Also in 1999, 36,652 mt (55% of the total) came from the Western Gulf and 21,643 mt (32%) came from the BSAI.

Kodiak Island inshore plants. Most Kodiak plants process all major groundfish species groups every year, although generally fewer plants process pollock than process other species. In 1999, all of the facilities processed Pacific cod and Atka mackerel, rockfish, sablefish, and other flatfish (ARSO) and 9 of the 10 processed pollock and flatfish. The facilities processed a total of 101,354 mt round weight of groundfish in 1999, 51% of which was pollock and 30% of which was Pacific cod. All of the plants receive fish from the Central Gulf subarea every year. Most of the plants also receive fish from the Western Gulf and Eastern Gulf subareas.

Southcentral Alaska inshore plants. This group includes plants that border the marine waters of the GOA (east of Kodiak Island), Cook Inlet, and Prince William Sound. There have been 16 to 22 Southcentral Alaska inshore processors participating in the BSAI and GOA groundfish fishery every year since 1991. In 1999, there were 18 plants in southcentral Alaska processing groundfish. All 18 plants reported processing Pacific cod, flatfish, and ARSO in 1999. In addition, 16 of the 18 reported processing pollock. The facilities processed a total of 10,846 mt round weight of groundfish, 42% of which was compromised of Atka mackerel, rockfish, sablefish, and other flatfish, and 31% of which was Pacific cod. Virtually all of the plants receive fish from the Central Gulf subarea every year. Many also receive fish from the Eastern Gulf subarea, and some receive fish from the Western Gulf subarea. In 1998 and 1999, fewer than four processors took deliveries from CVs operating in the BSAI.

Shoreside processors that process between 500 mt and 1000 mt of groundfish in a calendar month currently are required to have observers 30% of the days that they receive or process groundfish. Shoreside processors that process 1000 mt or more of groundfish in a calendar month are required to have observers 100% of the days that they receive or process groundfish. Other regulations provide special coverage requirements for CDQ and AFA species. Table 4.6-2 show the firms that had 100% and 30% observer coverage in 1996-1998.

Table 4.2-5 Shoreside plants with 30% and 100% coverage requirements during 1996-1998

100% Observer Coverage Plants	*Area*	*Primary Products, 1996-1998*
Alaska Pacific Seafoods	Kodiak	Pollock: surimi, fillet; Pcod: fillet
Alyeska Seafoods	Dutch Harbor	Pollock: surimi, fishmeal, fish oil
Arctic Enterprise		Pollock: fillet, fishmeal
Cook Inlet	Kodiak	Pollock: H&G, fillet
Cook Inlet	Seward	Pollock: whole, fillet
Int'l Seafoods	Kodiak	Pollock: fillet, surimi; Pcod:fillet
King Crab, Inc		Pollock: fillet; Pcod: fillet
Northern Victor		Pollock: fishmeal, fillet
Ocean Beauty	Kodiak	Pollock: fillet; Pcod:fillet
Peter Pan	King Cove	Pcod: fillet, salted; Pollock:fillet
Star of Kodiak	Kodiak	Pollock: fillet, surimi
Trident Seafoods	Akutan	Pollock: surimi, fishmeal, fillet
Trident Seafoods	Sand Point	Pollock: surimi, meal, fillet: Codfillet
Unisea	Dutch Harbor	Pollock: surimi, fishmeal, fish oil
Western Alaska	Kodiak	Pollock: surimi, fillet
Westward Seafoods	Dutch Harbor	Pollock: surimi, fishmeal, fish oil
30% Observer Coverage Plants		
Deep Creek Custom Pack	Homer	Pcod: whole
North Pacific Processors	Cordova	
Resurrection Bay	Seward	Sablefish: H&G; Pcod: H&G
Sahalee of AK	Anchorage	Sablefish: H&G; Pcod: H&G
Seward Fisheries	Seward	Sablefish: H&G;

4.2.5 Observer provider companies

Four observer provider companies are currently active in the North Pacific, reduced from six in 2000. The companies that are currently permitted by NMFS and actively providing observers in North Pacific groundfish fisheries are: Alaskan Observers, Inc. (AOI); Northwest Observers, Inc. (NWO); Saltwater Observers, Inc. (SWI); and TechSea International (TSI). Of these, three are based in the Seattle area and one is based in Anchorage. The principal activity of all of these companies is providing observers for the North Pacific Groundfish Observer Program, but most of them also provide observers for other observer programs within or outside of Alaska, or are involved in other business activities. There are substantial differences among the observer providers in terms of both the proportion of their income generated by providing observers for the groundfish fishery and the proportion of the total groundfish observer deployment days they provide. All of the observer provider companies are considered small entities under the Regulatory Flexibility Act.

4.2.6 Observer coverage levels under the alternatives

One of the issues of primary interest to industry and the public is the issue of coverage levels. Under the status quo, four basic coverage levels are established in regulation: 200% coverage, 100% coverage, 30% coverage, and zero coverage. Vessels and processors fall into one of these four categories based on various criteria including vessel size, processing mode, target fishery, and participation in special programs such as the CDQ fishery. Under the action alternatives, these four basic coverage levels would be replaced by four coverage tiers:

- **Tier 1 fisheries (200% coverage).** These are fisheries in which two observers must be present so that observers are available to sample every haul on processors or delivery on vessels. Tier 1 fisheries are generally those in which observers are directly involved in the accounting of individual vessel catch or bycatch quotas.

- **Tier 2 fisheries (100% coverage).** These are fisheries in which one observer is deployed on each vessel and processor. In contrast to Tier 1, it is recognized that the observer will likely be unable to sample all hauls or deliveries due to workload constraints and will, therefore, follow random sampling procedures so that the vessel or processor will not know in advance which hauls or deliveries will be sampled. Under certain circumstances, vessels that would otherwise qualify for Tier 1 coverage could operate with a single observer in Tier 2 if they are operating under restricted hours, or under an alternative monitoring plan approved by NMFS in which alternate technologies are used to monitor scales when the observer is absent.

- **Tier 3 fisheries (regular coverage generally less than 100%).** *(This tier replaces the old 30% coverage requirement).* These are fisheries in which NMFS is dependent on observer coverage for inseason management but in which 100% coverage on every vessel is unnecessary because observer data is aggregated across a larger fleet. Vessels participating in Tier 3 fisheries can expect to receive coverage on a regular basis and will be required to carry observers when requested to do so by NMFS. However, the actual coverage that each vessel receives will depend on the coverage priorities established by NMFS and the sampling plan developed for the individual fishery in which the vessel is participating. The actual coverage a particular vessel or processor receives could range from zero to 100%, but on a fleet-wide basis, coverage levels are more likely to average closer to 30%.

- **Tier 4 fisheries (infrequent coverage).** These are fisheries in which NMFS is not dependent on observer data for inseason management. Coverage levels in Tier 4 fisheries are expected to be low and infrequent and used for special data needs and research rather than inseason management. Halibut vessels, jig vessels, and groundfish vessels <60' are likely to fall into Tier 4. In these fisheries, NMFS could deploy observers on vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data. Vessels participating in Tier 4 fisheries would be required to carry observers when requested to do so by NMFS but such requests are unlikely to occur on a regular basis.

Under this new four tier structure, the coverage levels would remain unchanged from the status quo for most vessels and processors that currently have 100% or 200% coverage requirements. While existing regulations specifying the type and level of coverage in Tier 1 and Tier 2 fisheries may require some adjustment and consolidation under the restructured program, none of the alternatives under consideration would completely repeal the coverage requirements for vessels in Tier 1 and Tier 2 fisheries. The biggest change in coverage would occur for vessels that currently have 30% coverage requirements or no coverage requirements. Under the four tier structure, most current 30% vessels would fall into Tier 3 and can expect regular coverage at a level less than 100%. Most vessels that currently have no coverage requirements will be included in Tier 4 and will be required to carry an observer when requested, but can expect such coverage to be a relatively rare occurrence. A summary of the proposed tier classifications is provided in Table 4.2-5.

Table 4.2-6 Proposed tier levels for vessels and processors

Vessel/processor/fishery	*Current coverage requirement and future coverage requirements proposed under other programs*	*Proposed tier classification*
AFA CPs	200% coverage	Tier1
CDQ CPs	200% coverage	Tier 1
AFA motherships	200% coverage	Tier 1
AFA inshore processors	1 observer for each 12 hour period (i.e. 2 observers if plant operates more than 12 hours/day)	Tier 1
non-AFA trawl H&G vessels ≥125' in the BSAI	100% coverage currently. 200% coverage under Amendment 79 groundfish retention standard (GRS)	Tier 2
CPs fishing for Atka mackerel in the Aleutian Islands Subarea	200% coverage	Tier 1
non-AFA Trawl H&G vessels <125' in the BSAI	30% coverage currently. However, 200% coverage would be required under proposed BSAI Amendment 80 if these vessels joined fishery cooperatives.	Tier 2
non-AFA Trawl H&G vessels ≥125' in the GOA	100% coverage	Tier 2
CVs >60' and pot CPs fishing CDQ	100% coverage	Tier 2
non-AFA Trawl H&G vessels <125' in the GOA	30% coverage	Tier 2
non-AFA inshore processors	0%, 30%, or 100% based on processing volume	Tier 3
Trawl CVs ≥125' (Including CDQ and AFA)	100% coverage	Tier 2 or Tier 3 with possible video monitoring requirement.
Trawl CVs 60'-125' (Including CDQ and AFA)	30% coverage	Tier 3
Longline CPs ≥125'	100% coverage	Tier 2
Longline CPs 60'-125'	30% coverage	Tier 2
Longline CVs 60'-125'	30% coverage	Tier 3
Longline CVs ≥125'	100% coverage	Tier 3
Pot vessels ≥60'	30% coverage	Tier 3
Halibut vessels	no coverage	Tier 4
Jig vessels (all sizes)	no coverage or 30% depending on vessel length	Tier 4
Groundfish vessels <60'	no coverage	Tier 4

4.2.7 Description of and basis for Tier 1 coverage

Under existing regulations, four management programs (CDQ, AFA, Steller sea lion protection, and the upcoming groundfish retention standard for non-AFA trawl catcher processors ≥125') impose 200% coverage on some or all vessels and processors participating in the program. Under the proposed new tier structure, all of these vessels and processors would be included in Tier 1. No changes in coverage requirements for 200% coverage vessels are proposed under the new tier structure. The following groups of vessels and processors would continue to be subject to 200% coverage:

- **CDQ Program:** Trawl and longline CPs fishing in the CDQ program.

- **AFA pollock fishery:** AFA CPs in all fisheries, AFA motherships, and AFA inshore processors when processing AFA pollock.

- **Aleutian Islands Atka mackerel fishery:** Under existing Steller sea lion protection measures, all CPs fishing for Atka mackerel in the Aleutian Islands subarea must carry two observers at all times if participating in the registration program that allows fishing in Steller sea lion critical habitat.

- **Proposed Amendment 79 GRS:** Non-AFA trawl CPs ≥125' subject to the Amendment 79 groundfish retention standard (GRS).

During the development of each of these four management programs, 200% coverage was determined to be necessary for a variety of reasons. The following is a summary of the stated rationale for 200% coverage in each program in which it is required.

200% coverage in the CDQ program

In developing regulations to implement the CDQ program, NMFS interpreted the Council's original motion regarding the CDQ Program, along with other periodic consultations with the Council prior to implementation, to represent the following fisheries management objectives.

- Allocate a percentage of all BSAI groundfish species and prohibited species to the CDQ Program to provide eligible western Alaska communities the opportunity to participate in all BSAI groundfish fisheries to support fisheries-related economic development and employment in these communities.

- NMFS must manage the CDQ fisheries so that the overall catch is limited to the percentage allocated to the CDQ Program. No catch of CDQ or PSC species from the groundfish CDQ fisheries will be allowed to accrue against the non-CDQ TAC amounts or PSC limits.

- All quota categories will be managed with the same level of accounting. No distinction will be made between target species and incidental catch or between retained and discarded catch.

- Groundfish incidental catch in the halibut CDQ fisheries should accrue against the CDQ groups' groundfish CDQ allocations.

The original CDQ Program design stipulated that all groundfish CDQ and PSQ harvested by vessels participating in the groundfish CDQ Program must be accounted for in the allocations made to CDQ groups. This was the premise for the original catch accounting structure for the multispecies CDQ Program, as developed in 1998. While, for the most part, none of the groundfish or PSQ catch made in the groundfish CDQ fisheries accrues to the non-CDQ TACs or PSC limits, there are exceptions to this original design, including those made for squid, pollock, and "other species."

Squid was removed from being an allocated CDQ reserve in 1999, subsequent to the AFA-instituted increase of the pollock CDQ allocation from 7.5 to 10% of the annual pollock TAC. Squid caught in the CDQ fisheries accrues towards the annual squid TAC. The AFA also brought changes to how pollock caught in fisheries other than the directed pollock fishery should be accounted for in both CDQ and non-CDQ fisheries. Pollock caught in CDQ fisheries other than the directed CDQ pollock fishery accrues towards the annual pollock incidental catch allowance (ICA), as does pollock caught in other non-CDQ, non-pollock fisheries. Pollock accruing towards the pollock ICA does not account toward either the pollock CDQ reserve or towards individual groups' pollock CDQ allocations.

The "other species" category is another exception. This CDQ reserve is no longer allocated to individual CDQ groups, based on a 2003 Council recommendation intended to alleviate a potential constraint on CDQ fisheries. Instead, "other species" catch in the CDQ fisheries accrues towards the annual other species CDQ reserve. If the entire annual amount of "other species" available in this reserve is caught, additional other species catch in the CDQ fisheries accrues towards the non-CDQ other species TAC. NMFS has assumed the management of other species catch in the CDQ fisheries, in conjunction with the management of other species catch in the BSAI groundfish fisheries as a whole.

Based on these program objectives, NMFS developed a management program in which the majority of CDQ fishing activities are monitored by observers. All groundfish catch on vessels equal to or greater than 60 ft LOA and all groundfish CDQ deliveries to shoreside processors must be monitored by a certified groundfish observer. Observers monitoring CDQ fisheries must meet certain performance standards beyond those required for basic certification. This includes prior experience as an observer, meeting or exceeding certain performance ratings, and completion of "Level 2" observer training. Observer data provides:

- estimates of total catch weight for all groundfish CDQ species (not just retained catch)
- an independent source of information about groundfish CDQ catch, rather than vessel operator estimates
- catch data that is available to vessel operators, NMFS, and CDQ groups in a timely manner

Vessels fishing for groundfish CDQ must have the required number of appropriately trained and rated (Level 2) observers to participate in the groundfish CDQ fishery, as detailed in Table 4.2-6. Each CDQ set or haul must be available to be sampled. CDQ deliveries to shoreside processors must be monitored by a Level 2 Observer. The effect of these requirements is that all trawl and longline CPs are required to carry 200% observer coverage.

Table 4.2-7 CDQ program coverage requirements

Vessel or Processor Category	*CDQ Observer Requirements*
CV <60 ft, any gear	none
CV ≥60 ft trawl gear	1 Level 2 observer
CV ≥60 ft, nontrawl gear, Option 1[1]	1 Level 2 observer
CV ≥60 ft, nontrawl gear, Option 2[2]	1 lead Level 2 observer
CP, trawl and motherships-*directed fishing for pollock*	1 lead Level 2 observer and 1 regular observer
CP, trawl and motherships-*not directed fishing for pollock*	1 lead Level 2 and 1 Level 2 observer
CP, longline gear	1 lead Level 2 and 1 Level 2 observer
CP, pot gear	1 lead Level 2 observer
Shoreside processor[3], deliveries from vessels using trawl gear	1 Level 2 observer for each CDQ delivery
Shoreside processor, deliveries from vessels <60' using nontrawl gear and groundfish CDQ fishing	1 Level 2 observer for each CDQ delivery
Shoreside processor, deliveries from vessels <60' using nontrawl gear and halibut CDQ fishing	no observer required for delivery
Shoreside processor, deliveries from vessels using nontrawl gear, Option 1[1]	1 Level 2 observer per CDQ delivery. May use vessel observer under certain conditions.[4]
Shoreside processor, deliveries from vessels using nontrawl gear, Option 2[2]	no CDQ observer required for delivery

[1]Option 1 refers to the CDQ catch accounting option that requires the vessel operator to retain all groundfish CDQ and salmon PSC and deliver it to a processor where it is sorted by species, weighed, and reported to NMFS. Under this option, CDQ catch accounting data is based on the processor's reports for groundfish CDQ and salmon PSC and on the observer data for halibut PSC, if applicable.

[2]Option 2 refers to the CDQ catch accounting option under which the CDQ group chooses to use data collected by the vessel Level 2 observer to estimate the catch of all groundfish CDQ and PSC. Under this option, catch may be discarded at sea and the processor's reports of landed catch weight are not used as the basis for CDQ catch accounting.

[3]Includes stationary floating processors.

[4]Instead of having a separate observer for the shoreplant, the vessel observer may monitor sorting and weighing of CDQ delivery as long as working hour limitations for the vessel observer are not exceeded.

While this analysis does not currently propose any changes to CDQ coverage requirements, the Council and NMFS may wish to consider whether some of these requirements can be consolidated upon implementation of a new program restructuring that includes some or all CDQ fisheries.

200% coverage in the AFA pollock fishery

In the AFA pollock fishery, all AFA CPs and motherships are required to maintain 200% coverage, and all inshore processors are required to maintain at least one observer for every 12 hour period in which the plant receives or processes groundfish. For AFA inshore processors, the effect is that they must maintain 200% coverage during every day in which they operate more than 12 consecutive hours. Under the AFA, CVs are not required to maintain any additional coverage beyond that which is required of all CVs for each length category in regulation.

The 200% coverage requirement for all AFA CPs is set out at paragraph 211(b)(6) of the AFA which states:

> *(6) OBSERVERS AND SCALES.—The catcher/processors eligible under paragraphs (1) through (20) of section 208(e) shall—*
>
> *(A) have two observers onboard at all times while groundfish is being harvested, processed, or received from another vessel in any fishery under the authority of the North Pacific Council; and*
>
> *(B) weigh its catch on a scale onboard approved by the National Marine Fisheries Service while harvesting groundfish in fisheries under the authority of the North Pacific Council.*

The AFA is silent with respect to observer and scale requirements for AFA motherships and inshore processors, however, in developing regulations to implement the AFA, NMFS determined that similar requirements were necessary for motherships and inshore processors. The 200% coverage requirement was determined to be necessary in order to accommodate the formation of cooperatives in the mothership and inshore processing sector as was authorized by the AFA. The primary purpose of establishing cooperatives in the AFA pollock fishery was to rationalize the fishery by allowing each individual vessel owner to secure their own pollock quota allocation that could be fished or leased to other fishermen. The successful implementation of the cooperative program in the mothership and inshore sectors required that NMFS monitor each individual landing by every vessel in every cooperative so that the numbers used by NMFS to manage the fishery would match the numbers used by each cooperative to manage their collective harvests. This level of monitoring requires 200% coverage and certified scales at each location where pollock is landed and processed, meaning all AFA CPs, motherships, and inshore processors.

In addition, NMFS is responsible for monitoring sideboard limits on the amount of groundfish and PSC that may be harvested by AFA CPs and AFA CVs. Therefore, the AFA-related 200% coverage requirement extends to all groundfish harvested and processed by AFA CPs and motherships, not just pollock, with one exception. Because unlisted AFA CPs are not subject to the sideboard restrictions, the 200% coverage requirement only applies while they are engaged in directed fishing for pollock. The AFA CP fleet is divided into two categories of vessels: listed CPs are those listed by name in the AFA, and unlisted CPs are those that are not listed by name in the AFA but that qualify based on having harvested more than 2,000 mt of pollock in 1997. Only one unlisted AFA CP has been permitted by NMFS. Table 4.2-7 provides a summary of AFA observer coverage requirements.

Table 4.2-8 Observer requirements for AFA CPs, motherships, inshore processors, and CVs

Vessel or processor type	*Coverage requirement*
AFA listed CP	Two NMFS-certified observers, at least one of which must be certified as a lead level 2 observer, for each day that the vessel is used to harvest, process, or take deliveries of groundfish. More than two observers are required if the observer workload restriction would otherwise preclude sampling every haul[1]
AFA unlisted CP	Two NMFS-certified observers for each day that the vessel is used to engage in directed fishing for pollock in the BSAI, or takes deliveries of pollock harvested in the BSAI. At least one observer must be certified as a lead level 2 observer. When an unlisted AFA catcher processor is not engaged in directed fishing for BSAI pollock and is not receiving deliveries of pollock harvested in the BSAI, the general observer requirements for non-AFA CPs of the same size class apply.
AFA mothership	Two NMFS-certified observers, at least one of which must be certified as a lead level 2 observer, for each day that the vessel is used to harvest, process, or take deliveries of groundfish. More than two observers are required if the observer workload restriction would otherwise preclude sampling every haul.[1]
AFA inshore processor	One observer for each 12 consecutive hour period of each calendar day during which the processor takes delivery of, or processes, groundfish harvested by a vessel engaged in a directed pollock fishery in the BSAI. An AFA inshore processor that takes delivery of or processes pollock harvested in the BSAI directed pollock fishery for more than 12 consecutive hours in a calendar day is required to provide two NMFS-certified observers for each such day.
AFA CVs	No additional coverage requirements beyond those that apply to all CVs.

[1]The time required for the observer to complete sampling, data recording, and data communication duties may not exceed 12 consecutive hours in each 24-hour period, and the observer may not sample more than 9 hours in each 24-hour period.

Aleutian Islands Atka mackerel fishery

The 200% observer coverage requirements for the Aleutian Islands Atka mackerel fishery were included in the final rule that established Steller sea lion protection measures in the pollock, Pacific cod, and Atka mackerel fisheries (68 FR 204, January 2, 2003). This final rule established a lottery system in which vessels wishing to fish for Atka mackerel inside Steller sea lion critical habitat are distributed between Areas 542 and 543 in equal numbers and are subject to strict limits on the amount of Atka mackerel that can be harvested within critical habitat in each area. Because Atka mackerel vessels may fish both inside and outside of critical habitat during a fishing trip, NMFS determined that an observer must be present to sample and estimate the amount of Atka mackerel in every haul so that total removals from critical habitat can be accurately determined. Because CPs fishing for Atka mackerel generally operate on a 24 hour basis, this requirement meant that two observers must be present on every vessel to ensure that all hauls can be sampled.

BSAI Amendment 79 groundfish retention standard (GRS)

Under proposed Amendment 79 to the BSAI FMP, adopted by the Council in June 2003, all non-AFA trawl CPs fishing in the BSAI will be subject to a minimum GRS for all groundfish fisheries (excluding pollock target fisheries). The GRS would not supersede the 100% retention standard already set for pollock and Pacific cod under existing IR/IU regulations. In addition to establishing a GRS, the regulation

would require that processors create product that yield at least 15% from each retained fish harvested. The GRS requirement set up the following annual retention requirements for non-AFA CPs ≥125':

Year	GRS
2005	65%
2006	75%
2007	80%
2008	85%

The GRS requirement under Amendment 79 also specified that all regulated vessels are to use NOAA Fisheries-certified scales to determine total catch and either maintain 200% observer coverage for verification that all fish are being weighed, or use an alternative scale use verification plan approved by NOAA Fisheries. The 200% coverage requirement for GRS fisheries was established because NMFS determined that effective enforcement of the program required that an observer be available to determine the total catch weight of each haul by monitoring the flow scales and ensuring that all groundfish harvested by the vessel is weighed. The proposed rule for BSAI Amendment 79 is expected in 2005.

4.2.8 Description of and basis for Tier 2 coverage

Under existing regulations, all trawl and longline vessels ≥125' fishing for groundfish in the BSAI and GOA are subject to 100% coverage requirements unless they are subject to 200% coverage under one of the four programs described above under Tier 1. Shoreside and stationary floating processors that process more than 1,000 mt round-weight equivalent of groundfish in a calendar month are required to have at least one observer present for each day that groundfish is received or processed during that month. These 100% coverage requirements are a legacy of the Observer Plan implemented in 1990 under Amendments 13/18 which established zero, 30% and 100% coverage requirements for all vessels based on vessel length and processing volume. Under Amendments 13/18, it was assumed that the larger and higher-volume operations (vessels ≥125' and processors with volume over 1000 mt/month) would be better able to afford and accommodate higher levels of coverage and that it was more efficient to impose higher coverage requirements on those vessels and processors that were harvesting and processing larger volumes of groundfish.

In addition, CVs ≥60' of all gear types and pot CPs fishing in the CDQ program are required to have 100% coverage under the CDQ observer coverage requirements as displayed in Table 4.2-6. Finally, under BSAI Amendment 79, CPs subject to the new groundfish retention standard have the option of operating with 100% coverage if they use an alternative scale use verification plan approved by NMFS to ensure that all groundfish hauls are weighed and properly accounted.

In determining which vessel classes and fisheries to assign to the Tier 2 category, decisions must be made about which of these vessels and processors must continue to have 100% coverage for management purposes, and which could be included in the more flexible Tier 3 category under which NMFS determines the coverage for each vessel (which could range from zero to 100%).

In fisheries where the observer is actively involved in the monitoring of some form of individual vessel quota, such as is the case for vessels required to have coverage under the CDQ program and Amendment 79, the monitoring demands of each respective program require the presence of an observer. The monitoring plan for CDQ and alternate scale use verification plan for Amendment 79 cannot accommodate less than 100% coverage without jeopardizing the program objectives and enforcement of each program. **Therefore, in both these instances, 100% coverage would continue to be required and both fisheries would be assigned to Tier 2.**

For those vessels currently required to have 100% coverage that are not participating in any type of individual quota program, the decision about whether 100% coverage is required is more difficult. Four general groups of vessels and processors fall into this category:

- non-AFA trawl CPs ≥125' operating in the GOA
- longline CVs and CPs ≥125' operating in both the GOA and BSAI
- AFA CVs ≥125' operating in the BSAI and GOA, and
- shore-based processors that process more than 1000 mt round-weight equivalent of groundfish in a calendar month.

In addition, two groups of vessels that currently have 30% coverage (longline and trawl CPs <125') are proposed to be included in Tier 2, and two groups of vessels and processors that currently have 100% coverage requirements are proposed for inclusion in Tier 3 (CVs ≥125' and non-AFA inshore processors) The rationale for these four changes are as follows:

Catcher vessels ≥125'

Most if not all CVs ≥125' are AFA vessels that operate primarily in the AFA pollock and BSAI Pacific cod fisheries. Because such vessels are subject to AFA groundfish sideboards in the GOA, they have only operated to a limited extent in the GOA since the implementation of the AFA. Therefore, the two fisheries of primary interest are the AFA pollock and BSAI Pacific cod fisheries. In both of these fisheries, CVs over and under 125' operate side-by-side and deliver to the same processors and there is no compelling reason to subject these two components of the AFA fleet to different coverage levels. In the case of the pollock fishery, the primary location for catch accounting is the processing plant rather than the vessel, and all pollock landings are weighed on certified scales and observed by a plant observer. The primary task of vessel observers is to collect PSC data (primarily salmon and herring) and to ensure that pollock and Pacific cod are not discarded in violation of full retention requirements. While larger vessels tend to harvest and deliver larger volumes of pollock, the disparity between AFA CVs greater and less than 125' is not sufficient in and of itself to require higher levels of coverage on vessels ≥125'. Some larger CVs have the ability to do extensive at-sea sorting because they load their fish holds via conveyer systems and that raises additional concerns about possible at-sea sorting if observers are not present.

In the BSAI Pacific cod fishery, the operational disparity between AFA CVs greater than and less than 125' is even smaller. In fact, many of the larger AFA CVs have been designed so specifically to operate in the high-volume midwater pollock fishery that they do not generally engage in bottom trawling for Pacific cod because it is less efficient for them to do so than for smaller, more versatile CVs. Consequently, the number of AFA CVs ≥125' that operate in the BSAI Pacific cod fishery is lower than in the AFA pollock fishery and in the Pacific cod fishery there is less disparity in the groundfish volumes harvested by vessels greater than and less than 125'. However, because at-sea discards of pollock is a concern across the entire AFA CV fleet, NMFS believes it may be appropriate to consider including all AFA CVs in the Tier 3 category only with the inclusion of a video monitoring requirement to ensure that catch is not sorted or discarded at sea. A vigorous at-sea video monitoring program for the AFA inshore sector could greatly reduce the number of observers required to monitor this fleet because species composition and PSC monitoring could be accomplished at the processor. The AFA inshore CV fleet may be the most appropriate place in which monitoring technologies such as video could be tested as an alternative to traditional coverage. Additional information on the current state of video monitoring technology is contained in Appendix 1.

Longline CPs <125'

Longline CPs <125' operate primarily in the BSAI Pacific cod fishery, and to a lesser extent in the halibut/sablefish IFQ fishery and GOA Pacific cod fisheries. The longline CP fleet in the BSAI is divided between vessels under and over 125' that currently face 30% and 100% coverage requirements, respectively. In 2003, 11 longline CPs <125' and 29 longline CPs ≥125' operated in the BSAI Pacific cod fishery. However, despite the length difference, these two groups of longline CPs generally operate in an identical manner and often harvest similar volumes of groundfish. This is because some longline CPs were built right up to the 125' size limit and have similar operational capacities as vessels greater than 125'. This is especially the case in the longline fishery where catch per unit effort is less dependent on horsepower than in the trawl fisheries. In contrast to trawl vessels, the speed at which both longline and pot vessels are able to retrieve gear and harvest fish is more dependent on the skill of the crew than on the horsepower or length of the vessel. For this reason it does not make sense to maintain two separate coverage levels for the freezer longline fleet based on vessel length. Rather, the entire class of longline CPs of all lengths should be assigned to a single Tier category so that coverage on this fleet can be managed in a uniform manner. **NMFS has expressed concerns about the ability to obtain viable data on CPs of any length without observers and, therefore, recommends that both trawl and longline CPs <125' be subject to 100% coverage and be placed into Tier 2.**

Trawl CPs <125'

In 2003, seven trawl CPs <125' operated in the GOA and two in the BSAI. Under current regulations, these vessels are subject to 30% coverage. Many of these vessels are former CVs that were converted to at-sea processing by adding plate freezers and converting their fish holds into freezer holds. These vessels generally target Pacific cod, flatfish, and rockfish in the GOA and BSAI. Because they process at sea, NMFS is concerned about obtaining accurate catch and bycatch information on these vessels without observers. **Therefore, NMFS recommends assigning these vessels to Tier 2.**

Non-AFA inshore processors

Under the existing regulations, coverage requirements for non-AFA inshore processors are based on processing volume with higher-volume processors subject to 100% observer coverage requirements. Under the proposed new tier classification scheme, all non-AFA inshore processors would be grouped into the Tier 3 category and would be subject to regular observer coverage when requested to receive and observer by NMFS. This will provide NMFS with the flexibility to deploy additional observers at sea if it is determined that at-sea coverage is a higher priority than 100% coverage at all higher-volume inshore processors. Because plant observers at non-AFA plants are not directly involved in catch accounting as they are at AFA plants, and do not collect information used for inseason management purposes, there is a less compelling reason to maintain 100% coverage at all higher-volume processors when such observers may be more useful if deployed elsewhere.

In some situations there are several weeks when these CPs operate with no observer coverage. Data that is crucial to managing the fisheries is not available during this time and PSC catch is not accounted for. This raises significant management and potential conservation concerns for NMFS. Using substitute rates substitute rates does not accurately reflect fishing mortality and may not capture all vessel activity. Vessels fishing in the same area can have significantly different discard and PSC rates. Increasing observer coverage requirements on these vessels would eliminate these data voids by providing managers with a source for estimating PSC and total catch. Additionally, these vessels are only required to submit catch information on a weekly basis, where observers would submit data to NMFS on a daily basis providing a significant improvement in NMFS' ability to manage inseason TAC and PSC catch.

It should be emphasized, however, that inclusion of a fishery in the proposed new four-tier coverage system is dependent on inclusion in the overall restructured Observer Program. In other words, the tier structure would apply only to those fisheries that are included in the preferred alternative. Therefore, the proposed inclusion of CVs and freezer longliners ≥125' in the new Tier 3 classification is dependent on their being included in the preferred alternative. This would only be the case if the Council includes these vessels in the program as an option under Alternative 6, or selects Alternative 7 as the preferred alternative. In all other instances, such vessels would remain in their existing coverage categories under the current pay-as-you-go regulations because they would not be included in the restructured Observer Program.

4.2.9 Description of and basis for Tier 3 coverage

Under all of the action alternatives, all vessels and processors that are currently required to have 30% coverage would be included in the Tier 3 category under which they can expect to receive coverage on a regular basis and would be required to carry an observer when requested to do so by NMFS. However, for each individual vessel, the actual coverage received could range from zero to 100% depending on the coverage plan developed by NMFS for each individual fishery. All Tier 3 fisheries share several characteristics:

- *Observer data used for inseason management purposes*. The primary threshold between Tier 3 and Tier 4 fisheries is that Tier 3 fisheries are those in which observer data is necessary for inseason management of catch or bycatch quotas. Generally, these are the fisheries that currently have 30% coverage requirements. In these fisheries, observer data is used to monitor groundfish catch and discards, and PSC discards. But discard and PSC rates are aggregated across a large fleet, making 100% coverage unnecessary.

- *Vessels not operating under individual bycatch quotas.* In Tier 3 fisheries, vessels are not operating under individual bycatch quotas, meaning that bycatch data from observed vessels can be applied to unobserved vessels operating in the same time and area. Therefore, it is not necessary to obtain bycatch data from every vessel in order to generate bycatch estimates for the entire fishery.

- *If vessels are operating under individual catch quotas, monitoring is done onshore*. Even if vessels are operating under a system of individual vessel quotas, 100% coverage may not be necessary if the primary location for catch accounting is the shoreside processor rather than the vessel. AFA CVs and sablefish IFQ vessels are two examples of vessels that are operating in individual quota-based fisheries where the primary catch accounting is done onshore rather than at-sea. In both of these instances, vessels are subject to a 100% retention requirement for all species for which individual vessel quotas apply, to ensure that all fish harvested can be properly accounted for onshore.

How much coverage is necessary in Tier 3 fisheries

The question of how much coverage is necessary for conservation and management purposes is one of the most difficult questions to answer for North Pacific groundfish and halibut fisheries because observer data is used for a wide variety of conservation and management purposes. In fisheries where observers are deployed solely to collect one type of management data (such as the incidence of porpoise bycatch in the tuna fishery), it may be possible to design a coverage plan for the fishery based on management decisions about the necessary level of accuracy and preciseness of the bycatch estimates. However, in the North

Pacific groundfish fisheries, multiple science and management objectives overlay a complex array of different fisheries that are determined by target species, gear type, and area. In addition, some management objectives such as bycatch management are subjective in nature in that bycatch limits are established as a matter of policy and are not driven by biological parameters. For this reason, it is beyond the scope of this analysis to determine what level of coverage is required in each Tier 3 fishery, or for Tier 3 fisheries overall. The annual process by which NMFS would make this determination is discussed in Section 4.3.2.

Rather than attempt to establish specific coverage levels for each Tier 3 fishery, this analysis starts with the current levels of coverage that are achieved under the status quo and assumes that if NMFS is provided with the flexibility to deploy observers when and where they are most needed, data quality could be improved over the status quo without an increase in the total amount of coverage present in Tier 3 fisheries. Table 4.2-9 displays the current percentage of groundfish that is observed in each BSAI and GOA groundfish fishery and identifies some of the management purposes for which observer data is used. As shown in Table 4.2-9, in every fishery for which observers are currently deployed, data is used for a wide variety of purposes.

Table 4.2-9 Percentage of total catch that was observed (sampled for species composition) by gear type and fishery in 2001, 2000, and 1997

BSAI fisheries					***Primary current uses of observer data***									
		Percent of BLEND total catch observed			*Catch comp. and monitoring*	*Halibut PSC*	*Crab PSC*	*Salmon trawl bycatch*	*Seabird bycatch*	*Individual vessel catch monitoring*	*Stock assess-ment modeling*	*Other mgt. programs*	*Data analysis for proposed mgt. measures*	*Posting of vessel specific weekly bycatch rates*
Gear	***Target***	***2001***	***2000***	***1997***										
Longline	Pacific cod	52%	53%	66%	X	X			X	CDQ	X		X	X
	Sablefish	23%	25%	19%	X				X	CDQ	X		X	X
	Turbot	78%	65%	55%	X	X			X	CDQ	X		X	X
Pot	Pacific cod	28%	15%	24%	X						X		X	X
Trawl	Atka mackerel	72%	72%	71%	X	X	X			CDQ and SSL limits	X	VIP	X	X
	Pollock	76%	77%	63%	X	X	X	X		AFA, CDQ, SSL CH limits	X	VIP	X	X
	Pacific cod	38%	38%	65%	X	X	X	X		CDQ	X	VIP	X	X
	Flatfish[1]	65%	68%	52%	X	X	X	X		CDQ	X	VIP	X	X
	Rockfish	72%	89%	73%	X	X	X	X		CDQ	X	VIP	X	X
	Yellowfin sole	45%	49%	58%	X	X	X	X		CDQ	X	VIP	X	X
GOA fisheries														
Gear	***Target***	***Percent of BLEND total catch observed***												
Longline	Pacific cod	14%	6%	9%	X	X			X		X		X	X
	Rockfish	5%	3%	3%	X	X			X		X		X	X
	Sablefish	23%	22%	8%	X						X		X	X
Pot	Pacific cod	10%	11%	3%	X						X		X	X
Trawl	Pollock	18%	25%	32%	X	X		X			X	VIP	X	X
	Pacific cod	18%	12%	17%	X	X		X			X	VIP	X	X
	Deepwater flat	18%	28%	22%	X	X		X			X	VIP	X	X
	Flatfish[2]	19%	20%	20%	X	X		X			X	VIP	X	X
	Rockfish	39%	41%	48%	X	X		X			X	VIP	X	X
	Rex sole[3]	54%	40%	(4)	X	X		X			X	VIP	X	X

SOURCE: NMFS Alaska Region, June 2002 from BLEND and Observer databases

[1]Includes "other" flatfish, flathead sole, and rock sole
[2]Includes flathead sole target
[3]Includes arrowtooth target
[4]No comparable data in 1997

4.2.10 Description of and basis for Tier 4 coverage

The remaining groundfish and halibut fisheries that do not fall into Tiers 1 through 3 would be categorized as Tier 4 fisheries. These are fisheries where coverage levels would be low and infrequent, and observer data would be used primarily for special data needs and research rather than inseason management. In these fisheries, NMFS could deploy observers on vessels when necessary to collect needed baseline data or to respond to specific data needs, but would not deploy observers on a regular basis to collect inseason management data.

- *Observer data not used for inseason management.* In a variety of fisheries, observer data is not currently used for inseason management purposes and vessels are managed through the use of landings data provided by processors. Examples include the halibut IFQ fishery and the jig fishery.

- *Low volume of fish harvested.* In a variety of fisheries, the volume of groundfish harvested by each vessel is so low that coverage is more efficiently applied to vessels that harvest larger volumes. For example, it may take ten fixed gear vessels <60' to equal the daily volume of a single trawler in the 60'-125' vessel size class. Therefore, an observer operating on a fixed gear vessel <60' would only be able to sample 1/10th of the volume of groundfish as an observer operating on the larger trawl vessel. If necessary, volume thresholds could be established to ensure that only low volume vessels remain in Tier 4 and that small vessels that exceed certain catch tonnage thresholds could be assigned to Tier 3.

In sum, the proposed classification of each fishery into the four tiers is shown in Table 4.2-6 in this chapter. Note that while the tier classifications closely match the existing coverage requirements, there are several instances where vessel and processor categories that currently have 100% coverage requirements are proposed to be included in Tier 3 rather than Tier 2. These are described in Section 4.2.8.

4.3 Deployment of observers under the alternatives

The following sections describe potential frameworks for making observer deployment decisions under Alternative 7 (all groundfish vessels and processors and halibut vessels). However, many of the concepts discussed below could be used to make deployment decisions for vessels and/or processors included in any action alternative.

Under the proposed tier system, coverage requirements would be defined in regulation for Tiers 1 and 2. Vessels in Tiers 3 and 4 would be required by regulation to carry an observer when notified by NMFS. **As fisheries evolve and data, information, and monitoring needs increase or decrease, fisheries could change tiers by Council action and subsequent rulemaking.** The impetus for these changes would likely be driven by recommendations from NMFS to meet these changing information needs or by Council action to implement monitoring components for future management programs. Furthermore, the analysis informing this action describes the monitoring and information characteristics for each tier. As fisheries evolve, the Council may determine a particular fishery best fits within the description of another tier and recommend a change to that tier.

The information NMFS would need from industry to support coverage decisions would be specified in regulation. These information needs would likely be specific to tier level. For example, the information needed to make active deployment decisions for a small catcher vessel operating in the GOA may be different than an AFA catcher/processor. For catcher vessels, NMFS may need real time information on fishing locations and target species to make coverage decisions. For large catcher/processors, NMFS may

need advance notice of fishing plans and intended port calls so coverage can be planned and coordinated. Proposed information needs for each tier are described below. **NMFS is interested in receiving comment and input from industry and observer contractors on these information needs.**

4.3.1 Observer deployment in Tier 1 and Tier 2 fisheries

Observer coverage for fisheries placed in Tiers 1 and 2 would be defined in regulation. The universe of vessels and shoreside and stationary floating processors (processors) in Tiers 1 and 2 is clearly defined and easily identifiable. Vessels and processors would work with NMFS or its contractor(s) (agent) to facilitate observer deployment logistics. NMFS or its agent would deploy an observer on a particular vessel based on that observer's skill level. The vessel would be required to carry the observer assigned to that vessel, which could include NMFS staff. Processors would be required to provide room and board for assigned observers. The information NMFS would need from industry to plan for observer coverage would be defined in regulations.

Information and information system needs to facilitate observer deployment

The following section describes proposed information and fishing notification requirements to facilitate the deployment of observers in the North Pacific. The more precise the information provided to NMFS by the fishing industry, the better NMFS or the contractor(s) could plan for observer coverage needs and control costs. NMFS is interested in comments from the fishing industry and observer providers on these proposed requirements.

Because contracting modules are likely to be renewed on an annual basis, NMFS would need to know each vessel or processor's annual fishing or operation plans. These plans would be required to be submitted with enough lead time to allow for advertising, bidding, and selection of contractors for the contract modules. Simple fishing plan information will allow NMFS to structure the modules with precise information, allowing for better contractor planning and cost control. Additionally, information on intended fishing operations collected from Tier 1 and 2 vessels would help ensure that observers would be available for required coverage. NMFS recognizes that long term planning involves projections which may change and would need to allow for periodic updates to the fishing plans.

During the fishing year, more specific information would be needed to make observer travel and deployment decisions. NMFS proposes that vessels would be required to provide the date and location they want observers to board a minimum of 10 days prior to that date. Shoreside processors would be required to provide NMFS or its agent the date they want to have an observer present at their facility a minimum of 10 days prior to that date. Under the modified pay-as-you-go fee option, this date would establish the start of the fee collection period. This requirement would provide industry the opportunity to confirm or refine their annual fishing or operation plan. It would also provide the contractor a specific target date to make logistical decisions specific to the deployment of observers.

To enable ongoing logistical decisions, NMFS proposes that vessels would be required to provide NMFS or its agent 48 hours notification of departure from any Alaskan port. Observer deployment limitations likely would mirror those currently described in regulation as NMFS has determined longer deployments could decrease overall data quality and shorter deployments could increase costs. These limitations likely would be implemented as contract provisions rather than regulations. NMFS anticipates the 48 hour vessel departure notice would provide ample opportunity for contractors to plan for observer rotations and comply with their contractual provisions. Given these observer deployment limitations, more than one observer would be deployed on most fishing vessels during a fishing year. Decisions to rotate observers would revolve around contract limitations, historic vessel operations, and anticipated future operations. Processors would not be required to notify NMFS of any operational activities beyond the requirements

already noted because the logistical problems associated with vessels are not present in shoreside plants. Contractors would be able to comply with contractual observer deployment limitations by arranging with processors to rotate observers when needed.

NMFS would implement an enforcement mechanism to ensure compliance with the 48 hour vessel departure notification requirement. Without an adequate enforcement mechanism, vessels could depart for a fishing trip without complying with this requirement. If NMFS or its agent were unaware that a vessel had departed an Alaskan port, or if a vessel had left insufficient time to allow arrangements to be made to rotate an observer who was reaching the deployment limitations described above, an observer could be deployed beyond these limitations.

Observer programs in other regions which have similar departure notification requirements are able to track vessel activity from a single port. For example, staff in the Hawaii Longline Observer Program are able to document vessel departures on a daily basis because they almost always depart from the same general location. However, tracking vessel activity for compliance with departure notification requirements with human resources would be labor intensive, complicated and costly in Alaska where vessels may not always depart from the same general location.

For these reasons, NMFS is exploring the use of VMS as a compliance tool for departure notification requirements. Many vessels currently are required to maintain a functioning VMS unit as part of another management measure. The Essential Fish Habitat EIS describes costs associated with VMS and requirements for groundfish vessels in the GOA and Aleutian Islands which currently are required to maintain VMS units (NMFS, 2005 Appendix C, Section 3.8.4). Monitoring vessel activity for compliance with requirements under the observer program would be an extension of these enforcement activities.

In sum, vessels and processors in Tier 1 and 2 would be required to:

- **Submit anticipated annual fishing or operation plans to NMFS or its agent by a date specified in regulation**
- **Provide NMFS or its agent the date and location they want observers to board a minimum of 10 days prior to that date**
- **Provide NMFS or its agent 48 hours notification of departure from any Alaskan port**

4.3.2 Observer deployment in Tier 3 fisheries

Under Tier 3, industry would not have to monitor fishing effort and obtain observers to comply with Federal coverage regulations. Instead, they would need to take an observer when notified by NMFS. There are many methodologies that NMFS could use to distribute observers depending on the needs of scientists and managers, as well as a host of practical and logistical issues which would need to be considered to control costs and deploy observers effectively.

NMFS has three primary goals for coverage on Tier 3 vessels and processors. These include: 1) sufficient coverage to support in-season estimates of PSC and discard for use in fisheries catch accounting; 2) collection of total catch and biological information on a spatial and temporal scale to meet a range of science and management objectives; and 3) control costs.

Two scenarios are described below which can be considered bookends marking a range of activities which would meet goals for Tier 3 observer coverage. While these bookends are presented in terms of Tier 3 fisheries, the deployment processes described within each could be implemented for any alternative

adopted by the Council which includes fisheries where observers would be deployed less than 100 percent of the time.

Bookend 1: Annual coverage decision making model

Under Bookend 1, coverage levels would be defined by strata annually by NMFS based on information needs. Within each fishery, observers would be assigned to vessels by a random or systematic process to best meet the coverage targets. Some information would be needed from the fleet prior to fishing to enable observer assignments, but it could be less intensive than would be needed under Bookend 2 (described below) where decisions would be made in real time. For example, a check-in notice prior to each fishing trip could provide basic information to inform observer coverage decisions for that trip. Observer coverage targets for shoreside processors would also be determined on an annual basis, and processes incorporated for coverage decisions under this bookend would be designed to compliment information collected by various methods on vessels or operational constraints required by regulation.

An advantage of this bookend is that it would allow the existing processes which combine observer information with other sources to generate total catch estimates to continue without major redesign. Some adjustments to coverage levels could be made to better inform the estimation system. For example, coverage could be increased in areas where there are gaps in information. Current strata – area, time, gear type, fishery - could be used to inform coverage decisions, or others could be developed as needed. Use of the existing estimation system would greatly simplify implementation.

NMFS would convene internal annual meetings to review the prior year's coverage, gaps in that coverage, and priorities for the allocation of coverage in the coming year. NMFS would adjust coverage levels based on these needs. The ability to adjust coverage would, of course, be dependent on working within funding constraints.

Notification needs for vessels under this bookend would be less intensive than under Bookend 2. Information needed to assess each year's deployment model in terms of the goals stated above would be analyzed annually and in-season information provided by vessels would be needed to select specific vessels to carry an observer. Notification requirements for this bookend would include annual fishing plans, which are described above, and 24 hours notice prior to any departure from any Alaskan port. Information needs to make decisions on observer resource allocation for processors would include annual operating plans and a 24 hour notice of intent to commence processing operations

NMFS would implement an enforcement mechanism to ensure compliance with the 24 hour vessel departure notification requirement. Without an adequate enforcement mechanism, vessels could depart for a fishing trip without complying with this requirement. If NMFS or its agent were unaware that a vessel had departed an Alaskan port, vessels in Tier 3 fisheries could avoid observer coverage and undermine coverage goals and the ability of managers to close fisheries. For these reasons, NMFS is exploring the use of VMS as a compliance tool for departure notification requirements. An additional benefit of VMS in Tier 3 fisheries would be to provide managers with information about temporal distribution of vessel activity to better estimate observer coverage needs.

Once annual decisions on coverage goals are made, those goals would need to be implemented. Under this bookend, coverage is established annually, but the selection of vessels occurs daily. NMFS would use available daily information to select vessels and deploy observers based on the coverage goals. The selection could be randomized, systematic, or tailored to meet a clear and specific objective. For example, a vessel fishing in an area where no other observers are deployed could be targeted for priority selection. Once selected, the vessel would need to be officially notified of the requirement to take an observer and the duration that requirement would be in place. Any vessel fishing without an observer

after being notified of this obligation would be out of compliance. However, NMFS does not intend to notify vessels of coverage selection while they are on the fishing grounds and require them to come to port. The duration of coverage assignments would likely be based on the specific information needs of the agency, and cost considerations of both the agency and industry.

It is important to note that NMFS' ability to execute a coverage plan which achieves desired coverage targets will be dependent on the quality of the fishing plans submitted by industry. NMFS is interested in comments from industry and contractors on how best to structure these fishing plans, including what restrictions should be attached to them to enable an effective observer program.

Bookend 2: Real Time coverage decision making model

In 2003, NMFS experimented with a coverage model in the GOA which attempted to match rapid collection of fleet information to fishing effort with an intensive process of allocating observers to areas where coverage was lacking. This proof of concept pilot demonstrated that it is possible to obtain better coverage distribution if one has improved information about fleet behavior. Additionally, the pilot project highlighted that vessels make targeting decisions at the haul rather than the trip level. Any fishing trip may consist of hauls directed against multiple targets. In the current NMFS estimation system, all hauls within a trip are aggregated and assigned a collective target. The lessons learned from the pilot project raise the possibility of enhancing coverage to address specific fishery information needs.

To make real time decisions regarding observer deployment, decision makers must have adequate information and the systems to provide necessary information in a timely manner. Observer deployment decisions for vessels would be based on target fishery and recent temporal and spatial fishing patterns. Observer deployment for processors would balance the need for observers collecting information at sea with the goals of shoreside observation and monitoring. However, to avoid excessive costs and to simplify the decision making process, deployments of observers to processors likely would be determined at the beginning of a fishing season based on the expected coverage needs over the course of the season. As more information on fishing behavior is gathered, deployment decisions could be refined.

In addition to the annual fishing requirement noted, NMFS or its agent would need detailed information on effort and location from all Tier 3 vessels in near real time and prior notification of departure for each fishing trip. Effort and location information could be provided by electronic logbooks which collect this detailed information and could transmit that information to NMFS on a near real time basis. Electronic logbooks may be required to implement this approach to observer deployment. To make deployment decisions NMFS would require 24 hours notice prior to departure from any Alaskan port, with information about intended fishing operations such as area, gear type, and target species. Information needs for processors would include an annual operating plan, as described above, and a 24 hour confirmation of intent to commence processing operations. NMFS would implement an enforcement mechanism to ensure compliance with this notification requirement, which could include a VMS requirement for all vessels in Tier 3. For the reasons described above, decision makers only need to know when operations would be starting. Deployment decisions could then be made based on this information and expected data needs.

To implement this bookend, NMFS would need to develop a process which would prioritize information needs. This process would need to recognize the tradeoffs of information collected for science and management among different patterns of observer deployment. Vessel selection could be randomized, systematic, or tailored to meet a clear and specific objective. For example, a vessel fishing in an area where no observers are deployed could be targeted for priority selection. Once selected, the vessel would need to be officially notified of the requirement to take an observer and the duration that requirement would be in place. Any vessel fishing without an observer after being notified of this obligation would be

out of compliance. However, NMFS does not intend to notify vessels of a coverage selection while they are on the fishing grounds and require them to come to port. The duration of coverage assignments would likely be based on the specific information needs of the agency, and cost considerations of both the agency and industry.

Spanning the bookends

While two bookends have been described above, it is possible to develop approaches which include features of each of these two concepts. The bookends are provided to illustrate the range of possibilities. From a pragmatic perspective, Bookend 1 is closest to existing processes and could be more readily implemented. However, some ideas from Bookend 2 could possibly be utilized initially. For example, some observers could be used in reserve to fill gaps in information which are identified on a real time basis. This would allow an ongoing data collection system which meets annual deployment targets, but allows for some exploratory work and flexibility. NMFS intends to implement changes in Tier 3 fisheries in a manner which will simplify the transition from the current system and provide a foundation to meet future management information needs.

4.3.3 Observer deployment in Tier 4 fisheries

Vessels and processors in Tier 4 represent a component of Alaska groundfish fisheries and halibut fisheries which, historically, have been unobserved. Observer coverage has been proposed for different sectors of this tier for various reasons in the past, but none has been imposed. The first task for coverage under Tier 4, prior to any observation in this fleet, would be to assess and prioritize NMFS' information needs within this tier.

As part of the process of assessing and prioritizing information needs, NMFS would need some baseline information on fleet fishing behavior. Currently NMFS has minimal information that would support making coverage decisions in this tier. To address this information gap, NMFS is exploring a broad scale implementation of VMS. The information provided by VMS would enable NMFS to evaluate coverage needs in the future and approach Tier 4 needs in an organized and planned manner. However, NMFS recognizes that this tier contains a broad range of vessel types and sizes and there may be implementation concerns. NMFS would like feedback on these concerns so they can be addressed in further development of this analysis.

Prior to implementing coverage in this tier, there are a number of practical issues which would need to be addressed. These include insurance requirements, bunk space for an observer, safety, observer work space, and others. NMFS has deployed observers on many types and sizes of vessels extensively in other NMFS regions and these issues have largely been addressed. Additionally, a NMFS workshop was convened in 2003 which addressed observer deployment and safety issues on small boats for all regions of NMFS. A copy of the report generated from that workshop is available at:

http://www.st.nmfs.gov/st4/nop/workshops/NMFS_Small_Boats_Workshop_Summary_Report.pdf.

NMFS recognizes that this knowledge would need to be adapted to ensure workable plans for coverage in Alaska and is committed to working with industry to resolve these issues.

NMFS is not initially planning any broad scale coverage of this fleet. NMFS will work internally to identify and prioritize the issues to be addressed and may consider some limited pilot studies to begin to gather information on Tier 4 vessels. Broader coverage efforts would likely only come in future years. When decisions to deploy observers in Tier 4 are made, selection and enforcement protocols as described for Tier 3 would need to be implemented.

4.3.4 Respective Roles and Responsibilities

The following describes the specific roles that NMFS envisions under any alternative adopted by the Council:

NMFS

- Design of the coverage system and identification of coverage levels and vessel selection criteria;
- Contract monitoring (with WASC) and disbursement of payment;
- Debriefing and quality control;
- Data management;
- Collection of fees;
- Observer training (with the University of Alaska Anchorage);
- Provision of sampling and safety gear.

Contractor

- Implementation of the contract and coverage plan including vessel selection;
- Recruiting, hiring, logistics, performance management;
- Tracking costs and invoicing NMFS.

Industry

- Comply with tier specific reporting requirements;
- Payment of fees;
- Compliance with observer requirement once selected.

Council

- Review of annual coverage model proposed to be used by NMFS in the upcoming fishing year for Tier 3 vessels and processors.
- Development of FMP amendments and regulations to implement major changes to the program.
- Provide opportunity for public review of the program.

4.4 Direct and indirect costs of observer coverage under the alternatives

Under Alternative 1, vessels currently required to carry observers must contract directly with NMFS-certified observer providers to obtain their coverage. Based on information provided by observer providers and a salary range for observers that approximates the 2003 unionized salary rate, the total cost per observer day, under Alternative 1, is estimated at $355. This includes a $315/day average rate including Level 1 and Level 2 observers; an estimate of $25/day for airfare, possibly hotel, and other incidental expenses passed on to industry by observer providers; and $15/day for meals, a direct expense to vessels. Industry has indicated that they sometimes pay more than this for an observer. These costs vary on a case-by-case basis depending on duration of observer coverage and observer logistics. A salary increase for observers of approximately $5/day occurred in 2002 and again in 2003 under the current three-year contracts negotiated between the observers' union and each of several observer providers. The cost per observer day also increased in 2002 due to increased insurance costs for observer providers. NMFS assumes that these costs are passed on to industry by the observer providers.

Under Alternatives 2 through 7, the direct costs to vessels for observer coverage includes: (1) the ex-vessel fee percentage, (2) an estimated $15/day for meals, and (3) increased insurance costs faced by vessels required to carry observers.

Indirect costs to industry include the following: (1) increased operating costs that result from the inconvenience of accommodating an observer, and (2) foregone catch, production, and revenue resulting either from the loss of a berth for crew or from lost fishing time while waiting for an observer to arrive in port. These indirect costs are not expected to vary between the alternatives, except to the extent that coverage levels would vary under the alternatives.

Tables 4.4-1 and 4.4-2 provide a summary of the 2000 - 2003 average annual coverage days, estimated observer costs, ex-vessel value of groundfish landings, and average observer costs as a percentage of ex-vessel value for each vessel or processor type and management area. In the GOA, the estimated costs of observer coverage as a percentage of ex-vessel value generally range between 1% and 2% for catcher vessels, which harvest the bulk of groundfish. Non-AFA trawl CVs had the highest average observer cost for CVs at 2.34% over the four-year period, while pot CPs had the highest overall cost for CPs at 2.25% for the same period. In the BSAI, the estimated costs of coverage as a percentage of ex-vessel value are higher for some vessel classes, averaging over 4% for longline and pot CPs and as high as 8% in 2000 for longline CVs.

4.4-1 GOA Average annual number of observer days, annual coverage cost, and percentage of groundfish ex-vessel value, 2000-2003

Sector	*Vessel class*	*Observer days*				*Coverage cost (in millions)*				*Coverage cost as % of ex-vessel value*				
		2000	*2001*	*2002*	*2003*	*2000*	*2001*	*2002*	*2003*	*2000*	*2001*	*2002*	*2003*	*Average*
CP	Longline CP <125'	337	328	364	287	$0.12	$0.12	$0.13	$0.10	0.66%	0.76%	0.76%	0.65%	**0.71%**
	Longline CP ≥125'	162	125	258	334	$0.06	$0.04	$0.09	$0.12	0.98%	1.13%	1.22%	1.16%	**1.13%**
	Pot CP	89	74	64	19	$0.03	$0.03	$0.02	$0.01	2.23%	1.59%	3.44%	4.50%	**2.25%**
	Trawl CP <125'	165	186	191	264	$0.06	$0.07	$0.07	$0.09	1.69%	1.79%	2.09%	2.32%	**1.98%**
	Trawl CP ≥125'	419	341	382	499	$0.15	$0.12	$0.14	$0.18	1.24%	1.31%	1.19%	1.48%	**1.31%**
CP Total		1,172	1,054	1,260	1,402	$0.42	$0.37	$0.45	$0.50	1.02%	1.11%	1.12%	1.19%	**1.11%**
CV	AFA Trawl ≥125'	8		13	4	$0.00		$0.00	$0.00	2.54%	#DIV/0!	2.36%	0.80%	**1.82%**
	AFA Trawl 60'-124'	740	689	572	556	$0.26	$0.24	$0.20	$0.20	1.72%	2.11%	2.40%	2.44%	**2.09%**
	Longline ≥60'	622	546	464	559	$0.22	$0.19	$0.16	$0.20	1.13%	1.24%	1.11%	0.96%	**1.10%**
	Non-AFA Trawl ≥60'	848	976	847	825	$0.30	$0.35	$0.30	$0.29	1.95%	2.27%	2.89%	2.47%	**2.34%**
	Pot ≥60'	393	172	167	165	$0.14	$0.06	$0.06	$0.06	1.28%	1.96%	1.59%	1.24%	**1.42%**
CV Total		2,612	2,382	2,063	2,109	$0.93	$0.85	$0.73	$0.75	1.51%	1.85%	1.95%	1.65%	**1.71%**
Processors	AFA inshore	158	126	97	89	$0.06	$0.04	$0.03	$0.03	1.53%	1.48%	2.31%	1.99%	**1.71%**
	Aleut/Alaska Penn/Other BS	74	0	40	0	$0.03	$0.00	$0.01	$0.00	15.37%	0.04%	2.89%	0.00%	**4.42%**
	Floater	106	3	1	2	$0.04	$0.00	$0.00	$0.00	1.26%	0.61%	0.08%	0.24%	**1.08%**
	Kodiak	1,698	1,674	1,306	1,289	$0.60	$0.59	$0.46	$0.46	0.90%	1.14%	1.10%	0.94%	**1.01%**
	Mothership		6	12	3		$0.00	$0.00	$0.00	0.00%	27.13%	18.87%	6.55%	**15.48%**
	Southcentral	226	85	61	43	$0.08	$0.03	$0.02	$0.02	0.33%	0.16%	0.12%	0.06%	**0.18%**
	Southeast	0	0	0	0	$0.00	$0.00	$0.00	$0.00	0.00%	0.00%	0.00%	0.00%	**0.00%**
Processors Total		2,262	1,893	1,516	1,426	$0.80	$0.67	$0.54	$0.51	0.67%	0.73%	0.67%	0.52%	**0.65%**
GOA Total		6,047	5,329	4,839	4,938	$2.15	$1.89	$1.72	$1.75	0.96%	1.10%	1.09%	0.95%	**1.02%**
BSAI and GOA Total		36,579	36,985	35,272	37,047	$12.99	$13.13	$12.52	$13.15	1.60%	1.72%	1.56%	1.78%	**1.66%**

[1]Based on an estimated daily average cost of $355/day for 2000-2003 which includes estimated travel costs of $25/day and meal costs of $15/day.

Data sources: NMFS groundfish observer program data, NMFS Alaska Region BLEND data, ADF&G fish ticket data, ADF&G Commercial Operators Annual Reports (COAR), and NMFS Weekly Production Reports.

4.4-2 BSAI Average annual number of observer days, annual coverage cost, and percentage of groundfish ex-vessel value, 2000-2003.

Sector	*Vessel class*	*Observer days*				*Coverage cost (in millions)*				*Coverage cost as % of ex-vessel value*				
		2000	*2001*	*2002*	*2003*	*2000*	*2001*	*2002*	*2003*	*2000*	*2001*	*2002*	*2003*	*Average*
CP	AFA CP ≥125'	5,222	6,203	5,532	5,749	$1.85	$2.20	$1.96	$2.04	1.51%	1.60%	1.33%	1.66%	**1.52%**
	Longline CP <125'	1,578	1,417	1,404	1,563	$0.56	$0.50	$0.50	$0.55	4.11%	4.18%	4.83%	3.86%	**4.20%**
	Longline CP ≥125'	6,523	7,024	6,437	7,513	$2.32	$2.49	$2.29	$2.67	3.92%	4.56%	4.76%	4.51%	**4.42%**
	Pot CP	153	244	156	100	$0.05	$0.09	$0.06	$0.04	3.17%	4.96%	5.64%	3.61%	**4.27%**
	Trawl CP <125'	698	584	620	656	$0.25	$0.21	$0.22	$0.23	2.26%	2.96%	2.16%	2.30%	**2.37%**
	Trawl CP ≥125'	4,135	3,783	4,154	4,072	$1.47	$1.34	$1.47	$1.45	2.87%	2.34%	2.81%	2.82%	**2.70%**
CP Total		18,309	19,256	18,304	19,652	$6.50	$6.84	$6.50	$6.98	2.51%	2.53%	2.41%	2.70%	**2.54%**
CV	AFA Trawl ≥125'	4,264	3,768	3,773	4,099	$1.51	$1.34	$1.34	$1.46	1.89%	1.62%	1.49%	1.95%	**1.72%**
	AFA Trawl 60'-124'	2,585	2,563	2,466	2,634	$0.92	$0.91	$0.88	$0.94	0.98%	1.09%	0.85%	1.21%	**1.02%**
	Longline ≥60'	301	264	200	138	$0.11	$0.09	$0.07	$0.05	8.67%	7.70%	4.49%	4.10%	**6.13%**
	Non-AFA Trawl ≥60'	86	51	95	120	$0.03	$0.02	$0.03	$0.04	1.99%	4.06%	5.57%	3.24%	**3.20%**
	Pot ≥60'	780	785	812	1,054	$0.28	$0.28	$0.29	$0.37	2.30%	3.15%	3.80%	2.65%	**2.86%**
CV Total		8,015	7,432	7,346	8,045	$2.85	$2.64	$2.61	$2.86	1.51%	1.50%	1.29%	1.69%	**1.49%**
Processors	AFA inshore	2,276	2,686	2,640	2,528	$0.81	$0.95	$0.94	$0.90	0.55%	0.66%	0.60%	0.66%	**0.62%**
	Floater	598	705	613	88	$0.21	$0.25	$0.22	$0.03	4.72%	4.97%	2.89%	0.38%	**2.83%**
	Kodiak	442	223	154	178	$0.16	$0.08	$0.05	$0.06	1.57%	2.11%	1.10%	0.78%	**1.32%**
	Mothership	184	299	349	405	$0.07	$0.11	$0.12	$0.14	1.72%	2.03%	2.14%	2.49%	**2.13%**
	Aleut/AP/Other BS	934	1,139	1,088	1,256	$0.33	$0.40	$0.39	$0.45	1.34%	1.81%	1.07%	2.80%	**1.58%**
Processors Total		4,434	5,052	4,845	4,455	$1.57	$1.79	$1.72	$1.58	0.83%	0.99%	0.82%	0.91%	**0.89%**
BSAI Total		30,759	31,740	30,494	32,152	$10.92	$11.27	$10.83	$11.41	1.72%	1.80%	1.59%	1.90%	**1.74%**
BSAI and GOA Total		36,579	36,985	35,272	37,047	$12.99	$13.13	$12.52	$13.15	1.60%	1.72%	1.56%	1.78%	**1.66%**

[1]Based on an estimated daily average cost of $355/day for 2000-2003 which includes estimated travel costs of $25/day and meal costs of $15/day.

Data sources: NMFS groundfish observer program data, NMFS Alaska Region BLEND data, ADF&G fish ticket data, ADF&G Commercial Operators Annual Reports (COAR), and NMFS Weekly Production Reports.

4.4.1 Basis for coverage cost estimates and fee percentage endpoints

Under the proposed alternatives, coverage costs to individual vessels and processors will take one of two forms: (1) an ex-vessel value fee on landings (proposed under Alternatives 2 - 7); or (2) a daily observer fee based on the number of fishing days (proposed only under Alternatives 6 and 7). While the costs to individual vessels would vary depending on whether they are subject to an ex-vessel value fee or a daily observer fee, in both cases, the overall costs to the fleet are dependent on the daily cost of contracting for observer coverage.

In Tier 1 and Tier 2 fisheries that are proposed to be subject to a daily observer fee (under Alternatives 6 and 7), the daily fee would be based on the average daily cost of contracting for observer coverage. This daily fee could be adjusted upwards if fee revenues are used for any purpose other than direct coverage costs (i.e. equipment or overhead costs), or downwards if Federal funds become available to partially or fully subsidize the costs of coverage in Tier 1 and Tier 2 fisheries.

In Tier 3 and Tier 4 fisheries that are proposed to be subject to an ex-vessel value fee (under Alternatives 2-7), the fee percentage would be determined by three factors: (1) the desired level of coverage, (2) the daily cost of observer coverage, and (3) the total ex-vessel revenues of the affected fleet. Again, the ex-vessel value fee could be adjusted upwards if fee revenues are used for any purpose other than direct coverage costs (i.e. equipment or overhead costs), or downwards if Federal funds become available to partially or fully subsidize the costs of coverage in Tier 3 and Tier 4 fisheries. **Note, however, that the cost estimates in this analysis assume that the fee proceeds will only be used to pay for the direct cost of observer coverage and implementation costs would be paid by NMFS.**

4.4.2 Estimating the daily costs of coverage under the alternatives

Because the SCA would apply to any form of direct Federal contracting for observer services, a great deal of concern has been raised about the extent to which Federal contracts for observer coverage under the SCA would increase the coverage costs in the North Pacific. These concerns are based on two issues:

- Whether a prevailing wage established under the SCA would increase observer salaries relative to the no action alternative

- Whether a prevailing wage established under the SCA would include a requirement that observers be paid an hourly wage plus overtime under the requirements of the FLSA

Unfortunately, neither of those two issues can be completely resolved at this point, because both questions can only be resolved by the Department of Labor (DOL) rather than NMFS, and the DOL is unlikely to make any wage determinations specific to observers in the North Pacific fisheries until an actual coverage contract is submitted to the DOL for review. With respect to the determination of a prevailing wage, the DOL guidelines indicate that when the majority of employees in a particular job classification and region are covered by a collective bargaining agreement (CBA), the terms of the CBA are used to establish the prevailing wage and supersede any alternative wage determinations that might be made by the DOL. Because a majority of observers in the North Pacific are currently covered by a CBA, it is likely that the DOL would use the existing CBA as the basis for a prevailing wage determination for North Pacific fisheries, meaning that observer salaries would not change under the SCA. In the case that observers and observer providers fail to reach a collective bargaining agreement in the future, however, all parties must abide by the previous CBA. The extent to which future CBAs would be affected by a new contracting model is not possible to predict.

Recently the Department of Commerce Office of General Counsel (DOC OGC) issued an opinion that contracted fisheries observers are non-exempt from coverage under the Fair Labor Standards Act and other Acts, as appropriate, by virtue of their status as technicians, and therefore are eligible for overtime pay.[16] This determination was based on information provided by DOC OGC and Department of Labor representatives by NMFS' National Observer Program. The National Observer Program, in consultation with the National Observer Program Advisory Team, reviewed the duties and responsibilities of fisheries observers and developed a classification scheme identifying three levels of Fishery Observer for consideration by the Department of Labor (Level I/II/III). This classification scheme was submitted to the Department of Labor's Wage Determination Division on September 9, 2002, and established wage rates for contracted fisheries observers that are comparable to Federal Observers under the General Schedule (GS) system.

However, in a subsequent letter to the Council, NMFS noted that consultation with the DOC OGC and the DOL resulted in the determination that NMFS has limited responsibility with respect to observer remuneration. The DOL's Wage and Hour Division is the primary Federal agency responsible for enforcing the SCA and FLSA, and the DOL regulations do not relate directly to the circumstances of fishery observers whose tour of duty may exceed 24 hours. NMFS thus recognizes that further guidance may be useful regarding these requirements and how they pertain to fishery observers. The DOL has offered to provide training and guidance to NOAA contracting officers, observer providers, and other interested parties as appropriate on the SCA and FLSA. Information from these sessions would be summarized and made available to the public.[17] These training sessions, initially scheduled for February 2005, were subsequently cancelled. They have not yet been rescheduled.

It should be emphasized that the requirements of the FLSA apply to observers working in the North Pacific regardless of whether Council chooses to adopt a system of direct Federal contracting under one of the action alternatives, or chooses to remain with the no action alternative. In other words, if observers are legally entitled to overtime under a prevailing wage determination established by the DOL under a SCA contract, then they would also be legally entitled to overtime pay under the no action alternative in which wages are established solely through negotiation between observers and observer providers.

Reasons for treating North Pacific Observers as professionals and exempt from overtime pay under the FLSA

In its February 2005 memo to HQ regarding overtime pay, NMFS Alaska Region laid out a variety of reasons why North Pacific observers should be considered professionals under the FLSA. The memo noted that observer duties in the North Pacific are more complex and demanding than the duties of observers working in other regions of the US, and that North Pacific observers have the most comprehensive education and training requirements in the Nation. North Pacific observers are also responsible for many complicated catch accounting and reporting tasks in support of CDQ, bycatch reduction, and cooperative programs that track catch and bycatch on an individual vessel basis.

In addition, the nature of observer work in Alaska does not lend itself to the type of overtime pay structure used by observer programs in other regions. For example, in the West Coast Groundfish Observer Program, observers are assigned to fishing ports up and down the west coast and work under a pay scale that correlates to the cost of living in each port. Observers working in urban ports in California earn higher pay than those working in rural ports in the Northwest due to the higher cost of living. In designing its pay system, the West Coast Observer Program determined that observers deployed at sea

[16] Memo from William Hogarth to Terry Lee, November 13, 2003. See Appendix II.
[17] Letter from William Hogarth to Chris Oliver, September 27, 2004. See Appendix II.

worked an average of 12 hours/day and were deployed an average of 12 days/month. All observers receive a base pay that assumes 12 hours/day and 12 days/month and observers receive additional pay for each additional day they are deployed at sea beyond 12. Therefore, the program only needs to track the number of deployment days for each observer and not the actual number of hours worked during each deployment day. The SCA wage determination for this fishery took into account overtime pay in approving this wage structure.

However, the pay system used in the West Coast Groundfish Observer Program would be inappropriate in Alaska because observers working in Alaska do not generally reside in the towns in which they are deployed. Observers working in west coast ports generally maintain residences in the towns in which they are assigned and are free to use their off-time in any way they choose, including other forms of employment. In contrast, observers working in Alaska do not generally reside in the town or port in which they are deployed, and may have limited or no ability to use their off-time for leisure or other purposes. This is especially true in remote locations such as Akutan. For this reason, it is more appropriate and fair to pay observers for their number of deployment days rather than for the specific number of days that they might happen to work at sea during a given deployment. Otherwise, observers working in the North Pacific could find that their pay would vary greatly depending on the type of assignment they receive, but in most instances, they would have no ability to make productive use of the down-time for which they were not being paid.

Possible approaches to clarify the overtime pay situation

Although NMFS is not directly responsible for establishing prevailing wages and determining whether or not the overtime provisions of the FLSA apply to observers working in the North Pacific, there are two ways in which the overtime pay issue could be resolved in a more definitive manner:

- **Clarification/revision of observer duties and position descriptions**. NMFS could choose to modify the duties and position descriptions of North Pacific observers in such a way as to clarify in a more definitive manner whether observers are professionals and exempt from the overtime provisions of the FLSA, or technicians and subject to the overtime provisions of the FLSA. To this end, NMFS Alaska Region sent a memo to NMFS Headquarters requesting concurrence with its determination that groundfish observers in the North Pacific are professionals, and therefore exempt from the overtime requirements of the FLSA. This determination was based on the premise that North Pacific groundfish observers' duties are different, more complex, and more demanding than the duties of observers in other regions. In addition, the education and training requirements for North Pacific groundfish observers are the most comprehensive in the nation.[18] A response to this memo has not yet been received.

- **Statutory clarification**. Congress could amend the FLSA to clarify whether North Pacific observers are entitled to overtime under the FLSA. Many similarly situated maritime industries have statutory exemptions from the overtime requirements of the FLSA. Congress could choose to clarify this issue as part of the statutory authorization required for any of the action alternatives in this amendment, either by mandating that the overtime requirements of the FLSA apply to North Pacific observers, or by providing an exemption to the overtime requirements of the FLSA for North Pacific observers.

Given the uncertainties surrounding both the issue of SCA prevailing wage determinations, and the applicability of the overtime provisions of the FLSA, the daily costs of observer coverage under the

[18] Memo from James Balsiger and Douglas DeMaster to William Hogarth, February 4, 2005. See Appendix II.

alternatives cannot be predicted with absolute certainty at this time. For this reason, and given the rationale provided above, the cost estimates contained in this section are based on two assumptions:

- **Assumption 1**: SCA prevailing wage determinations for North Pacific fisheries are likely to be consistent with the terms of the existing CBA governing observer salaries in the North Pacific.

- **Assumption 2**: Observers will continue to be paid on the basis of a daily wage and will not be entitled to overtime pay under the FLSA.

Until the issue of overtime pay for observers is resolved, the cost estimates contained within this analysis should be considered the best information available at this point in time.

4.4.3 Proposed low and high fee percentage endpoints

In Tier 3 and Tier 4 fisheries, the costs of the program are not only dependent on the daily costs of observer coverage, but also on the coverage levels established for Tier 3 and Tier 4 fisheries and the ex-vessel revenues generated by those fisheries. Of these two factors, only the coverage levels are within the control of NMFS. NMFS has no way to control or predict the future ex-vessel revenues of groundfish and halibut landings, which will be determined by the future prices and future harvest levels of each species.

Regardless of the alternative chosen, setting an initial fee percentage is one of the biggest decision points in this amendment for the Council. The fee percentage (and the level of Federal funding) will determine the program's budget and will directly affect coverage levels in the fisheries covered by the program and the cost paid by industry. The issue of how much coverage is necessary or optimal to manage particular groundfish and halibut fisheries is a difficult one that is beyond the scope of this analysis. The analysis instead describes the process by which this determination will be made annually by NMFS (see Section 4.3.2).

Furthermore, most of the fisheries in question are currently evolving, as a rationalization program is under development for the GOA groundfish fishery and a cooperative proposal is under development for the non-AFA catcher processor groundfish fisheries in the BSAI under Amendment 80. It is also beyond the scope of this analysis to attempt to determine what levels of coverage will ultimately be necessary to implement the various rationalization and bycatch management proposals that are currently under development. For this reason, this analysis is limited to considering the fee percentages necessary to maintain existing levels of coverage and provide room to expand the program into fisheries that currently have no coverage at all (the halibut and under 60' groundfish fleets) in the absence of any direct Federal funding. To the extent that Federal funding becomes available, fee percentages could be reduced or coverage increased.

Therefore, two "end-point" fee levels are proposed for Council consideration under each alternative. In addition, a "mid-point" fee level is included to show the fee level necessary to provide 100% coverage on all trawl and longline catcher processors 60'- 125' as recommended by NMFS. Note that the difference between the two endpoints is based on changes in coverage levels in the Tier 3 and 4 fisheries, as those are the only fisheries in which the amount of observer coverage is flexible. By definition, the coverage levels in Tier 1 and 2 fisheries are automatically 200% and 100%, respectively.

Option 1: Low endpoint fee percentage. Maintain the existing number of deployment days in Tier 3 and 4. Under this option, the fee percentage would be set at the level necessary to provide an equivalent number of coverage days that are currently provided under the status quo. NMFS would have roughly the same number of observer days to work with as are available under the status quo, but would have the flexibility to deploy observers in a more rational fashion to maximize the utility of the data collected. Under this option, any deployment of observers in the halibut fishery and on groundfish vessels <60' would come at the expense of existing coverage levels on shoreside processors and groundfish vessels ≥60'. Under all of the alternatives, the average cost of observer coverage for vessels that currently carry observers would go down under this endpoint because the current number of coverage days would be supported by revenues from a wider fleet base than under the status quo.

The low-endpoint fee percentages for each alternative are generated by determining the total annual costs of observer coverage for the vessel and processor classes included in each alternative that are currently required to have observer coverage and dividing by the ex-vessel value of all groundfish and halibut landings for all vessels and processors included in the new program that would be assessed a fee. See Table 4.4-3.

Option 2: Mid-point fee percentage. Increase low endpoint to accommodate 100% coverage on all trawl and longline CPs <125'. Under this option, coverage for trawl and longline CPs <125' included under each alternative would be increased to 100% and the estimated fee percentages under each alternative would be increased to accommodate this increase in coverage. Based on 2000-2003 data, an estimated 1,902 additional observer days would be required to increase coverage to 100% for all longline and trawl CPs operating in the GOA that currently have 30% coverage requirements. An estimated 4,970 additional observer days would be required to make the same change in the BSAI for a total of 6,872 observer days to increase coverage to 100% for all trawl and longline CPs in both the BSAI and GOA (Table 4.4-4).

Option 3: High endpoint fee percentage. Establish a fee percentage that is self-supporting at current coverage levels for Tier 3 fisheries and apply the same fee percentage to all new Tier 3 and 4 fisheries into which the program expands. Under this option, the fee percentage would be set at a level necessary for fee revenues from the *currently covered* sectors of the industry (groundfish vessels ≥60' and shoreside processors) to fund the current number of deployment days in those sectors. Each new sector that is not currently covered (<60' vessels and halibut vessels) that is included under the new program would be required to pay the same fee percentage, and will thus generate additional fee revenues so that expansion of coverage into those fisheries would not necessarily come at the expense of existing coverage for vessels ≥60'. Because the average daily revenues generated by halibut vessels and groundfish vessels <60' are lower than the average daily revenues generated by groundfish vessels ≥60', and because observer costs per deployment day are generally higher for small vessels that operate out of more remote ports, fee revenues generated by halibut vessels and groundfish vessels <60' would not be adequate to extend coverage to those vessels at levels currently in effect for groundfish vessels ≥60'. A precise estimate of the level of coverage that the upper endpoint fee would provide for halibut and groundfish vessels <60' will be difficult to make because data on the average number of fishing days for such vessels is unavailable.

The high-endpoint fee percentages for each alternative are generated by determining the total annual costs of observer coverage for the vessel and processor classes included in each alternative that are currently required to have observer coverage, and dividing by the ex-vessel value of all groundfish landings made only by vessels in those same classes. The difference between the two formulas is in the denominator. Estimated fee percentages and the additional observer days that would be funded for each alternative under the high endpoint fee percentage are displayed in Table 4.4-5.

In sum, all of the action alternatives would allow for a more flexible and rational placement of observers, as well as placement of observers on vessels that are currently not covered (halibut and <60' vessels). The difference between the ex-vessel based fee options is that the **low-endpoint fee** would provide the same number of observer days as under the status quo, but it would be funded by a larger revenue base (includes halibut and <60' vessels). The **high-endpoint fee** would provide more observer days than under the status quo, so that observer coverage to the halibut and <60' fleets would not come at the expense of the ≥60' groundfish vessels with current coverage.

The low and high-endpoint fee percentages under each alternative can be compared to the average cost of observer coverage under the status quo (see Tables 4.4-1 and 4.4-2) to determine whether the average vessel in a particular class would be paying higher or lower average observer costs under each of the alternatives relative to the status quo. It should be emphasized that the low and high-endpoint fee percentages estimated for each alternative do not take into account any direct Federal funding. To the extent that the new program receives direct Federal funding to support the ongoing costs of observer coverage, the estimated fee percentages could be reduced or coverage levels increased.

Tables 4.4-3 through 4.4-5 show the estimated number of observer days, coverage costs, and fee percentages under the low, mid and high fee endpoints, respectively. These estimates are based on the average number of observer days and ex-vessel value revenues from 2000-2003. Table 4.4-5 also shows the estimated number of additional observer days that would be funded under the high-endpoint fee percentages for each alternative. Note that this table indicates the fees that would result from an ex-vessel based fee for all vessels and processors included in the program, as well as the fees that would result if Tier 1 and 2 fisheries were instead covered by a daily observer fee.

Table 4.4-6 provides a summary of the low, mid, and high endpoint fee percentages for each alternative for comparison purposes. As this table displays, the estimated fee percentages vary for each alternative. This is because the revenue base and current number of observer days for each sector of the fishery are not uniform. **The alternative which would provide the program with the largest revenue base relative to observer days is Alternative 3, which would require an estimated ex-vessel value fee of 0.48% to fund the current level of coverage under the low-endpoint option.** This is because under the Alternative 3 low endpoint, the number of observer days funded by the program is equal to the current number of observer days on groundfish vessels in the GOA (groundfish vessels ≥60' whereas the revenue base upon which the fee would be assessed includes all GOA groundfish vessels <60' and all halibut vessels in both the GOA and BSAI). **The highest estimated fee percentage under any alternative is 1.86% for Alternative 6, with all suboptions included.**

Alternative 7 is the comprehensive alternative, in which all vessels and processors would be included in the new program. For Alternative 7, two sets of fee percentages are provided. The first set of fee percentages for alternative 7 are based on a program in which only Tier 3 and 4 fisheries would be included in the ex-vessel value fee program and all Tier 1 and 2 fisheries would be funded separately through a daily observer fee. With respect to the fee program, this alternative is identical to Alternative 5, which would include all GOA groundfish vessels and all BSAI groundfish vessels that currently have 30% or lower coverage requirements. The second set of fee percentages for Alternative 7 are based on a program in which all groundfish and halibut fisheries off Alaska would be included in the ex-vessel value fee program in a manner similar to the previous Research Plan.

The estimated fee percentages vary among alternatives because each fishery that is added to or subtracted from the new program brings with it different coverage requirements and a different revenue base.

This analysis makes no attempt to project how many additional observer days would be required to accommodate proposed increases in observer coverage resulting from the implementation of the Amendment 79 GRS program, or Amendment 80 bycatch cooperatives and rationalization program.

Under these programs, most H&G trawlers would be subject to 200% observer coverage while operating in the BSAI. Previous rationalization programs such as the AFA have resulted in reductions in fleet size on the order of 40% and longer fishing seasons for the remaining participants. However, the extent to which similar results will occur in the trawl H&G fleet are difficult to predict. For this reason, this analysis does not simply double the average number of observer days used by this fleet in 2000-2003 to project estimated coverage needs for this fleet in the future. Nevertheless, coverage costs for this fleet are expected to increase as a result of the new groundfish retention standard, thus fee percentages would need to increase under Alternative 6 and Alternative 7, only if the option was selected to make Tier 1 and 2 fisheries subject to an ex-vessel value fee instead of a daily observer fee. The daily fee is assumed under Alternatives 6 and 7 as currently structured, although an explicit option is provided to alternatively allow the Council to select an ex-vessel based fee to be assessed on this fleet (Option 7).

Table 4.4-3 Low endpoint[1] estimated fee percentage for each alternative based on 2000-2003 average estimates of observer days and ex-vessel revenues

Alternative	Observer days	Observer cost (millions)[2]	Revenues subject to fee (millions	Estimated fee percent
Alt. 2	3,809	$1.35	$144	0.94%
Alt. 3	3,809	$1.35	$283	0.48%
Alt. 4	5,584	$1.98	$381	0.52%
Alt. 5	9,481	$3.37	$489	0.69%
Alt 6	11,611	$4.12	$511	0.81%
Alt 6-option 1	18,485	$6.56	$566	1.16%
Alt 6-option 2	15,647	$5.55	$564	0.99%
Alt 6-option 3	15,587	$5.53	$593	0.93%
Alt 6-all options	26,497	$9.41	$701	1.34%
Alt 7-Tiers 3,4 only	9,481	$3.37	$489	0.69%
Alt 7-all tiers	36,585	$12.99	$1,016	1.28%

[1]Based on maintaining current number of observer days

[2]Based on an estimated daily average cost of $355/day for 2000-2003 which includes estimated travel costs of $25/day and meal costs of $15/day.

Table 4.4-4 Mid-point[1] estimated fee percentage for each alternative based on 2000-2003 average estimates of observer days and ex-vessel revenues

Alternative	Observer days	Add'l obs days relative to SQ	Observer cost (millions)[2]	Revenues subject to fee (millions	Estimated fee percent
Alt. 2	5,711	1,902	$2.03	$144	1.41%
Alt. 3	5,711	1,902	$2.03	$283	0.72%
Alt. 4	7,485	1,902	$2.66	$381	0.70%
Alt. 5	11,382	1,902	$4.04	$489	0.83%
Alt 6	18,483	6,872	$6.56	$511	1.28%
Alt 6-option 1	25,357	6,872	$9.00	$566	1.59%
Alt 6-option 2	22,519	6,872	$7.99	$564	1.42%
Alt 6-option 3	22,459	6,872	$7.97	$593	1.34%
Alt 6-all options	33,369	6,872	$11.85	$701	1.69%
Alt 7-Tiers 3,4 only	11,382	1,902	$4.04	$489	0.83%
Alt 7-all tiers	43,457	6,872	$15.43	$1,016	1.52%

[1]Includes additional number of observer days necessary to increase coverage on CPs<125' from 30% to 100%

[2]Based on an estimated daily average cost of $355/day for 2000-2003 which includes estimated travel costs of $25/day and meal costs of $15/day.

Table 4.4-5 High endpoint[1] estimated fee percentage for each alternative based on 2000-2003 average estimates of observer days and ex-vessel revenues

Alternative	Observer days	Add'l obs days relative to SQ	Observer cost (millions)[2]	SQ revenue base base (millions)	Estimated fee percent
Alt. 2	5,937	2,128	$2.11	$92	1.47%
Alt. 3	11,714	7,904	$4.16	$92	1.47%
Alt. 4	11,213	5,629	$3.98	$190	1.05%
Alt. 5	15,803	6,323	$5.61	$293	1.15%
Alt 6	18,810	7,199	$6.68	$315	1.31%
Alt 6-option 1	28,239	9,754	$10.02	$371	1.77%
Alt 6-option 2	23,953	8,306	$8.50	$368	1.51%
Alt 6-option 3	23,257	7,671	$8.26	$397	1.39%
Alt 6-all options	36,745	10,248	$13.04	$506	1.86%
Alt 7-Tiers 3,4 only	15,803	6,323	$5.61	$293	1.15%
Alt 7-all tiers	45,301	8,716	$16.08	$821	1.58%

[1]Assumes that new fee revenues from currently uncovered fisheries (<60 groundfish vessels and halibut vessels) would be dedicated to new coverage rather than subsidizing existing coverage levels.

[2]Based on an estimated daily average cost of $355/day for 2000-2003 which includes estimated travel costs of $25/day and meal costs of $15/day.

Table 4.4-6 Estimated observer days, coverage cost, and fee percentages for low, mid, and high endpoint fee options based on 2000-2003 average coverage days and ex-vessel revenues

Alternative	Observer days			Observer cost			Estimated fee %		
	Low	Mid	High	Low	Mid	High	Low	Mid	High
Alt. 2	3,809	5,711	5,937	$1.35	$2.03	$2.11	**0.94%**	**1.41%**	**1.47%**
Alt. 3	3,809	5,711	11,714	$1.35	$2.03	$4.16	**0.48%**	**0.72%**	**1.47%**
Alt. 4	5,584	7,485	11,213	$1.98	$2.66	$3.98	**0.52%**	**0.70%**	**1.05%**
Alt. 5	9,481	11,382	15,803	$3.37	$4.04	$5.61	**0.69%**	**0.83%**	**1.15%**
Alt 6	11,611	18,483	18,810	$4.12	$6.56	$6.68	**0.81%**	**1.28%**	**1.31%**
Alt 6-option 1	18,485	25,357	28,239	$6.56	$9.00	$10.02	**1.16%**	**1.59%**	**1.77%**
Alt 6-option 2	15,647	22,519	23,953	$5.55	$7.99	$8.50	**0.99%**	**1.42%**	**1.51%**
Alt 6-option 3	15,587	22,459	23,257	$5.53	$7.97	$8.26	**0.93%**	**1.34%**	**1.39%**
Alt 6-all options	26,497	33,369	36,745	$9.41	$11.85	$13.04	**1.34%**	**1.69%**	**1.86%**
Alt 7-tiers 3,4 only	9,481	11,382	15,803	$3.37	$4.04	$5.61	**0.69%**	**0.83%**	**1.15%**
Alt 7-all tiers	36,585	43,457	45,301	$12.99	$15.43	$16.08	**1.28%**	**1.52%**	**1.58%**

4.4.4 Establishing a daily observer fee for Tier 1 and Tier 2 fisheries

Under the proposed daily observer fee for Tier 1 and Tier 2 fisheries under Alternatives 6 and 7, all vessels and processors operating in Tier 1 and Tier 2 fisheries would be assessed a daily observer fee that is equal to the actual average daily cost of observer coverage as determined by the coverage contract in effect for each fishery. Using estimated 2003 current coverage daily costs of $355 which include transportation costs, the daily observer fee would be $710 in Tier 1 fisheries (200% coverage) and $355 in Tier 2 fisheries (100% coverage).[19] Vessels and processors that are currently subject to 100% and 200% coverage and that are proposed for inclusion in Tier 1 or Tier 2 would face no change in their average daily observer cost relative to the status quo as long as the daily costs of coverage do not increase.

4.4.5 Coverage costs specific to the CDQ Program

In many instances, vessels and processors participating in the CDQ program face additional costs related to the increased coverage requirements imposed on the CDQ program. The current coverage requirements for CDQ vessels are presented in Table 4.2-6. Estimates of the costs imposed by these coverage requirements for each category of vessel participating in the CDQ program are displayed in Table 4.4-7 below. Because data on the actual coverage costs in CDQ fisheries are unavailable, these estimates are derived by taking the estimated coverage cost for each vessel class in non-CDQ fisheries and extrapolating upwards to account for the increased coverage requirements for CDQ fishing in some fisheries.

It should be noted that approximately 85% of CDQ harvests by weight are actually made by AFA CPs and AFA CVs fishing for AFA motherships. In both of these cases, the coverage requirements for CDQ and non-CDQ fishing are identical due to the additional coverage requirements already imposed on AFA vessels and processors. But for the remaining 15% of CDQ harvests that are made by non-AFA vessels and processors, coverage costs in the CDQ fisheries are dramatically higher. An estimated, 6.9% of total CDQ harvests are made by longline CPs $\geq$125' and 2.2% are made by longline CPs <125'. For these two vessel classes, the estimated costs of CDQ coverage as a percentage of ex-vessel value are 8.40% and 29.47%, respectively. Likewise, 5% of total CDQ harvests are made by non-AFA CPs $\geq$125' with an estimated coverage cost of 4.75%. However, these vessels would be subject to increased coverage requirements in non-CDQ fishing in the future under Amendment 79, at which point the coverage costs in CDQ and non-CDQ fishing would be the same.

[19] Note: A review of 2005 wage information that observer providers are required to file with NMFS indicates that average coverage costs have not increased from 2003 to 2005.

Table 4.4-7 Estimated costs of observer coverage in CDQ fisheries as a percentage of ex-vessel value

Sector	*Vessel Class*	*Average total groundfish catch 2000-2003*		*Estimated coverage cost as a % of exvessel value*	
		metric tons	*% of total*	*non-CDQ fishing*	*CDQ fishing*
CP	AFA CP	117,719	72.44%	1.52%	**1.52%**
	Longline CP ≥125'	11,236	6.91%	4.20%	**8.40%**
	Longline CP <125'	3,587	2.21%	4.42%	**29.47%**
	Pot CP	1	0.00%	4.27%	**14.24%**
	Non-AFA Trawl CP ≥125'	8,210	5.05%	2.37%	**4.75%**
	Non-AFA Trawl CP 60-124'	60	0.04%	2.70%	**18.02%**
CP Total		140,812	86.65%		
CV	AFA Trawl ≥125'	1,481	0.91%	1.72%	**1.72%**
	AFA Trawl <125'	372	0.23%	1.02%	**3.40%**
	Longline 60-124'	56	0.03%	6.13%	**20.44%**
	Longline <60'	32	0.02%	0.00%	**0.00%**
	Pot 60-124'	307	0.19%	2.86%	**9.53%**
	Pot <60'	22	0.01%	0.00%	**0.00%**
CV Total		2,270	1.40%		
Mothership	AFA Trawl ≥125'	19,418	11.95%	2.13%	**2.13%**

4.4.6 Summary of the economic effects on the fishing fleets

Under all of the alternatives, the only direct cost of the program on groundfish and halibut vessels is the ex-vessel value fee that would be assessed for fisheries covered by an ex-vessel value fee, and the daily observer fee assessed on those fisheries covered by a daily observer fee. The various estimated fee percentages shown in Table 4.4-6 represent the percentage of ex-vessel value that would be assessed under each alternative. Table 4.4-6 also displays the total coverage costs of each alternative. Total program costs will be higher than total coverage costs shown under each alternative because of the overhead required to develop and administer a new fee program and system of direct Federal contracting for observer services**. However, the estimated fee percentages shown on Table 4.4-6 are based on the assumption that fee proceeds will only be used to pay for the direct costs of observer coverage and that all program overhead and implementation costs would be covered by NMFS through other revenue sources.**

For those fisheries that would be subject to a daily observer fee, namely the Tier 1 and Tier 2 fisheries under Alternative 6 and 7, the costs of coverage are not expected to vary from the status quo. This is based on the two assumptions described in Section 4.4.2: (1) that the current CBA would be used as the prevailing wage under future SCA wage determinations, and (2) that a new system of overtime pay will not be required. If either of these two assumptions proves incorrect, then costs will vary and could increase in ways that are not possible to predict at this time.

Under the no action alternative, the distribution of observer costs in the existing Observer Program is viewed by many to be inequitable for one or both of the following reasons. First, although all participants in the groundfish, halibut, herring, salmon, and crab fisheries benefit from the data collected in the

groundfish Observer Program, only the participants in the groundfish fishery with observer coverage requirements (vessels ≥60') bear the cost. Second, among the groundfish fishing or processing operations that pay for observer coverage, the cost to each operation is not related to either the benefits it receives from the Observer Program, its ability to pay for observer coverage, or the benefit it receives from the resource. The current cost of a vessel's observer coverage is determined principally by its coverage requirements under current Federal regulations and the cost per day of obtaining observer services from an observer provider.

Alternatives 2 through 7 address the problem of inequity by imposing a uniform fee for all vessels and processors in Tier 3 and 4 fisheries, and Alternatives 6 and 7 provide an option (Option 7) to impose a uniform fee on all vessels participating in the program. However, the direct costs vary to some extent between these alternatives because the composition of vessels participating in the program varies among alternatives.

4.5 Additional costs not related to coverage.

This section will examine economic issues related to the choice of a fee type (ex-vessel value versus daily observer fee), the use of standardized or actual ex-vessel prices, and supplemental funding options. This section will examine TAC and price volatility on an annual and regional basis to determine how changes in total ex-vessel revenue will affect program stability and equity.

4.5.1 Costs of implementing and administering a fee collection program

All of the alternatives in this analysis assume that a uniform ex-vessel value fee would be established for all participants in the program that operate in Tier 3 and Tier 4 fisheries. Participants in Tier 1 and Tier 2 fisheries would operate under a daily observer fee similar to the current pay-as-you-go program under Alternatives 6 and 7. However, there also exists an option to Alternatives 6 and 7 that would apply a uniform ex-vessel value fee for all participants in the program.

Supplemental fees

The choice of a uniform fee for Tier 3 and Tier 4 fisheries is based on the assumption that all such fisheries would continue to be managed under the current open, or limited access management system which relies on aggregate data to manage TACs rather than individual vessel-specific data. However, the implementation of a rationalization program for GOA groundfish fisheries, and/or BSAI groundfish fisheries would greatly affect the data collection and monitoring requirements for those fisheries covered by the rationalization program. Monitoring and enforcement alternatives have yet to be developed for the GOA rationalization amendment, however the rationalization alternatives currently under consideration could require increased observer coverage. Other proposals such as the bycatch cooperatives under consideration for BSAI non-AFA CPs also could require significant increases in observer coverage.

The Council may wish to consider whether it is more equitable to fund the increases in observer coverage required by new rationalization programs through supplemental fees assessed only on the participants that benefit from such rationalization programs. Under this approach, vessels in fisheries that do not participate in new rationalization programs would not be required to subsidize the additional coverage in other fisheries from which they do not benefit. Most of the GOA and BSAI rationalization alternatives under consideration contain options for individual bycatch quotas at the individual vessel or cooperative level. These programs would likely require substantial increases in observer coverage to generate adequate catch and bycatch data at the individual vessel or individual cooperative level. If and when such programs are ultimately approved, the Council may wish to consider whether it may be more equitable to

fund such increases in observer coverage through a supplemental fee that is imposed only on those vessels that benefit from the rationalization program. Alternatively, at final action for those programs, the Council may determine that they need to move into a different tier category with increased coverage requirements (e.g., Tier 1 or 2).

Fee collection

A major issue with the previous Research Plan was the requirement that processors collect and submit vessel fees, which represented an administrative burden to processors. With advances in electronic reporting, fee tracking and submission could be largely automated. Therefore, the administrative burden associated with fee collection and submission is likely to be less than under the original Research Plan. On the other hand, the IFQ fee collection program is based on direct billing of fishermen and has proven that such a system is viable, at least in the context of IFQ fisheries where individual quotas (or fishing permits) may be withheld for lack of payment.

Annual post-season billing by NMFS (Alternatives 2 and 3) Under Alternatives 2 and 3, which do not include processors in the program, NMFS would follow the IFQ cost-recovery program model under which NMFS would bill vessel owners directly on an annual basis. This approach would require that NMFS develop effective enforcement mechanisms to address the potential problem of non-payment. One way to do so would be to withhold the renewal of fishing permits until observer fees from the previous year are paid. The costs of administering such a program would be covered largely by NMFS, using data already submitted by industry.

Processor collection at the time of landing (Alternatives 4 through 7). Under Alternatives 4 through 7, processors would be responsible for collecting fees from fishermen at the time of landing, and for submitting fee proceeds on a quarterly basis. Given recent advances in electronic recordkeeping and reporting, the collection of observer fees could be largely automated through modifications to existing software. Software automation should largely address the concerns expressed by industry about the paperwork burdens of fee collection during the development of the original Research Plan.

Costs to NMFS of implementing and administering a fee collection program

Under all of the alternatives, it is assumed that NMFS would cover the costs of implementing and administering a fee collection program and that neither ex-vessel value fees nor daily observer fees would be used to administer a fee collection program or to pay for any other type of program-related overhead. At present, NMFS has not made an estimate of either the implementation costs or administration costs of any of the fee programs under consideration. However, as a point of reference, the Restricted Access Management Division of NMFS Alaska Region estimates that the cost of database changes necessary to implement IFQ cost recovery fees were on the order of $75,000, and the ongoing administration of the IFQ cost recovery program requires one full-time employee and the overhead required to process and mail bills to all IFQ holders.[20]

Effects of price and landings volatility on fee collections

Total revenues generated by an ex-vessel value fee program are subject to fluctuations in both prices paid for each species and the tonnage of each species landed by vessels participating in the program. While NMFS to some extent controls total landings through the establishment of TACs, prices are controlled by the market and subject to a complex array of forces. Figure 4.5-1 displays the annual ex-vessel revenues from groundfish and halibut off Alaska from 1990 through 2003 as well as a 5-year running average of

[20] Jessie Gharrett, RAM Division, NMFS Alaska Region, pers. comm.

the total value of both groundfish and halibut over that same time period. This figure illustrates that while substantial fluctuations in the ex-vessel value of groundfish and halibut landings occur from year to year, the 5-year running average is relatively stable, with the exception of an increase in 2003 that is accounted for by an increase in the value of the halibut catch that year.

However, while annual revenues from the groundfish and halibut fisheries tend to fluctuate from year to year, sometimes dramatically, as occurred in 1998 when groundfish landings dropped 43% to $434 million from $639 million in 1997, coverage needs in the fisheries are far more stable from year to year. This is illustrated in Table 4.4-2 which shows that total coverage days in the groundfish fisheries of Alaska ranged between 35,272 and 37,047 from 2000-2002, a variation of approximately 5%. Consequently, an observer program dependent on revenues from an ex-vessel value fee will face substantial variations in annual budget if the program is based on a fixed fee amount that does not vary from year to year. One alternative approach that would produce a more stable revenue base from year to year would be to base the fee percentage on a multi-year average of revenues generated during the previous several years. This could be a 5-year weighted average as shown on Figure 4.5-1, or a weighted average that gives more weight to more recent years. Such an approach would limit annual variations in revenues and produce a more stable funding base upon which to plan coverage levels. Regardless of the approach taken, the ex-vessel value fee collection program must take into account annual fluctuations in revenues to produce a stable revenue base.

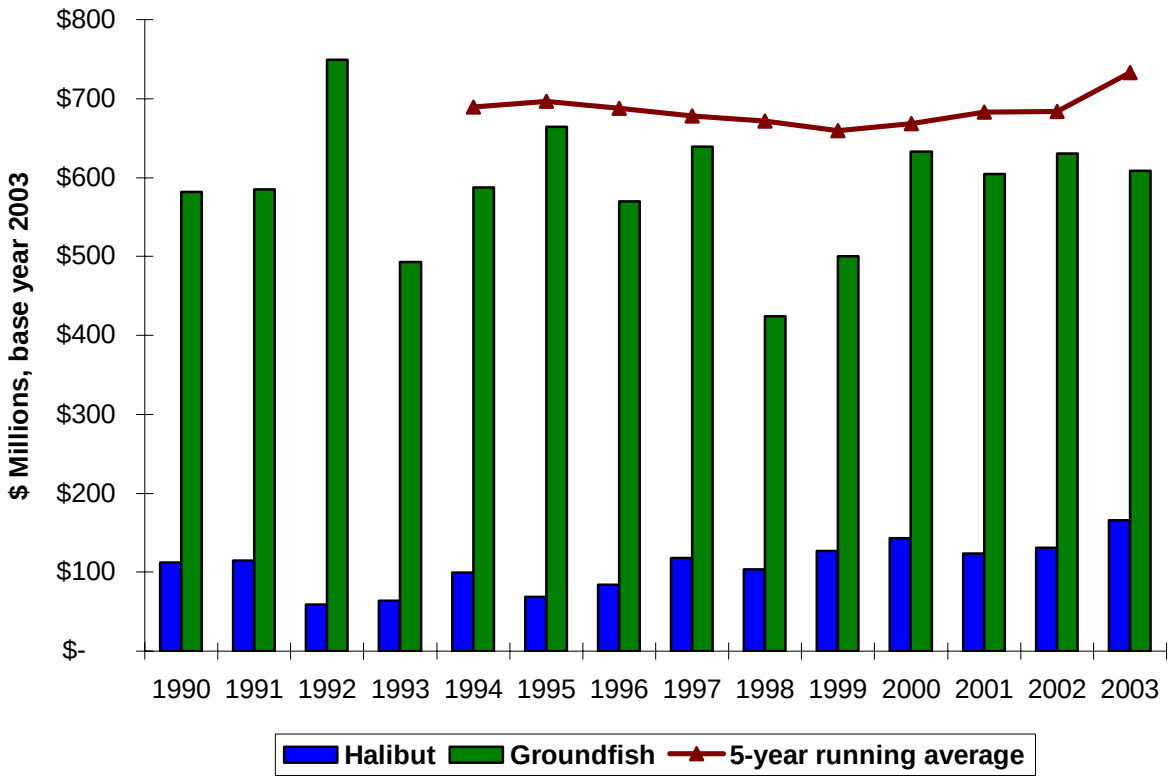

Figure 4.5-1 Annual ex-vessel value of the groundfish and halibut catch off Alaska, 1984-2003 (Adapted from Table 2.1 of Econ SAFE).

4.5.2 Cost of an electronic logbook requirement

Under all of the alternatives, some type of data collection system will be necessary to track the fishing activity of observed and unobserved vessels in order to inform decisions about when and where to deploy observers. This is primarily (or exclusively) an issue in Tier 3 and 4 fisheries with less than 100% coverage, because in Tier 1 and 2 fisheries with 100% and greater coverage, the deployment decisions are automatic. The vessel does not operate without one or two observers. The existing catch accounting system may be adequate for administering general coverage models. However, more sophisticated coverage models that are designed to respond to changing fishing patterns will require more precise and timely tracking of fishing activity than is provided by landing reports. The most viable method of tracking fishing activity in a more precise and timely manner would be the use of electronic fishing logbooks that are integrated with GPS or VMS technology.

While moving towards an electronic logbook requirement is a goal of NMFS and would provide important information to assist NMFS in deploying observers in the most effective manner, none of the alternatives contain a requirement that vessels obtain and use electronic logbooks. Instead, under all of the alternatives, NMFS could create incentives for vessels to use electronic fishing logbooks on a voluntary basis. The extent and type of such incentives would depend on available funding and would need to be determined during the program implementation phase.

Logbook record keeping and reporting are required for fishing vessels greater than 60' length overall to participate in the BSAI and GOA groundfish fisheries. Software has been developed to allow fishermen to record and submit data electronically. The NMFS Alaska Regional Office has developed software to accept the electronic logbook data and has approved the use of the electronic logbook system as an alternative to hard copy logbooks. Electronic logbooks are expected to be an efficient method to provide improved access to more accurate and complete information for fisheries research and management. In addition, electronic logbooks store data in a format that allows vessel operators to use the data more easily and more productively to monitor and improve fishing operations.

Compared to the hard copy logbooks currently used, electronic logbooks are expected to have several critical advantages with respect to providing data for fishermen, fishery research, and management. These advantages are listed in Section 2.5.1.

Electronic fishing logbook requirements have been developed in other fisheries around the world. Perhaps the most extensive use of electronic fishing logbooks outside the U.S. has been in Australia where the Australian Fisheries Management Authority (AFMA) has developed an electronic fishing logbook for various Australian fisheries. In the Australian example, AFMA does not involve itself in the development of electronic fishing logbook software, nor does it specify what software fishermen are required to use. Instead, AFMA has developed a set of specifications, including standard formats for logbook data and transmission that are available for all software venders. AFMA has procedures for testing the receipt of logbook data from different software venders and certifies those software packages that meet its established standards. Fishermen are free to use any electronic logbook system that meets AFMA standards.

Estimated costs of an electronic fishing logbook

The only company that currently provides electronic logbook software for use in North Pacific groundfish fisheries is OceanLogic, an Alaskan company that has created a variety of software packages. Because NMFS recordkeeping and reporting requirements change on an annual basis, the electronic fishing logbook must be updated annually. Therefore, OceanLogic charges an initial price to purchase the software package and an annual update fee to upgrade to the latest NMFS reporting requirements. The cost of a mandatory electronic logbook program in Alaska would likely need to be structured in a similar fashion, with an initial purchase price and an annual subscription fee to keep the software updated with the latest forms and reporting requirements. A widespread electronic fishing logbook requirement for North Pacific groundfish and halibut fisheries could bring additional companies into the market and end up reducing costs through competition, it is impossible to predict the extent to which that might happen.

Implementation issues related to electronic fishing logbooks

It should also be emphasized that immediate implementation of an electronic fishing logbook requirement for all fisheries may not be possible or desirable due to a lack of equipment and computer experience onboard many groundfish and halibut vessels, especially smaller vessels. The equipment requirements are a desktop or laptop computer running Windows software and a GPS device with an available output port that can be connected to the computer. While most vessels operating in the North Pacific have some sort of GPS device onboard, not all have Windows-based computers. In addition, a lack of computer experience on the part of many vessel operators could delay or prevent the immediate and widespread application of electronic fishing logbooks in North Pacific fisheries. **Therefore, this analysis proposes a voluntary electronic fishing logbook program during the initial years of the program, perhaps one in which fishermen are provided with financial incentives to voluntarily adopt electronic fishing logbooks as an alternative to the current paper fishing logs.** Financial incentives could include a Federal subsidy to cover some or all of the initial and ongoing software and hardware costs, and/or the use of observer fee proceeds to subsidize the costs.

4.6 Effects of the program on observers providers and observers

The effects of the proposed alternatives on observer providers and observers are somewhat difficult to predict without resolution of additional details such as the number and type of contracts to be issued. The following sections address preliminary conclusions that may be drawn.

4.6.1 Effects on observer providers

Many of the issues related to the design and implementation of Federal contracts for observer services have yet to be resolved by NMFS, and some cannot be resolved until a preferred alternative is selected and the scope of the new program is determined. These include the number and type of contracts, contract duration, and the scope of work covered under each contract. Under a new system of Federal contracting, NMFS could chose to continue to contract for observer coverage in much the same manner that industry does today with the observer provider companies responsible for little more than providing observers when and where requested. Alternatively, under the action alternatives, NMFS could choose to contract out some of the observer support and data review and editing tasks that are currently being handled in-house by the Observer Program. Until these types of issues are resolved and the most likely type of contracts are identified, it is difficult to evaluate how observer providers would be affected by the alternatives. Nevertheless, several preliminary conclusions can be made.

First, none of the alternatives contemplate a reduction in the total number of observer days that would be contracted for in the North Pacific. The low fee endpoints are designed to maintain the current number of

observer days and the high fee endpoints would involve an increase in the total number of observer days. Therefore, under all of the alternatives, the total amount of business available to observer providers is not expected to decrease.

Second, the current number of observer providers could be maintained if the Council and NMFS choose to adopt policies with that objective in mind. This is because the groundfish and halibut fisheries off Alaska can be subdivided into a number of discrete fisheries by vessel type and area, and contracts for observer services could be broken up in a similar fashion. In addition, NMFS could accommodate subcontracting so an observer provider receiving a contract could subcontract with other providers to meet certain coverage needs. On the other hand, NMFS and the Council could choose to adopt policies that would result in as few as one observer provider remaining in operation in the North Pacific. Logically, NMFS would want a number of observer providers to remain in operation to generate competitive bids when contracts are proposed. However, absent a clear policy direction from the Council or NMFS, it is not possible to speculate on the number of observer providers that would operate in the North Pacific under each of the alternatives, or the relative effects of the various alternatives on each provider.

4.6.2 Effects on observers

A majority of observers currently working in the North Pacific are members of the Alaska Fishermen's Union, and are working under collective bargaining agreements (CBA) that have been signed with three of the four observer providers that are currently operating in the North Pacific. None of the alternatives would affect any CBA that is currently in place or that will be in place at the time the preferred alternative is implemented. As long as a majority of observers working in the North Pacific are working under a CBA, this analysis assumes that it is likely that the DOL would base its SCA prevailing wage determinations on the terms of the CBA. The DOL is directed to do so according to the current DOL "Prevailing Wage Resource Book," which contains DOL's guidelines for making SCA prevailing wage determinations (DOL 2002). Therefore, under any of the action alternatives, observers working under a service delivery contract entered into by NMFS would be entitled to wages that equal the CBA in effect, regardless of whether or not they themselves are members of the union and covered by the CBA. It is difficult, however, to predict how observer salaries would change, if at all, under any of the alternatives. As discussed above, the issue of overtime pay has yet to be resolved for North Pacific observers, and it is difficult to predict how changes in the contracting process might affect the process for negotiating a new CBA.

4.7 Federal funding for start-up costs and ongoing program implementation

The likelihood of obtaining Federal funding to cover all or part of the ongoing costs of a restructured observer program is uncertain. However, Federal startup funds will be necessary prior to the first year of operation to fund the program until sufficient fees are collected to maintain the program on an ongoing basis. Because contract modules are likely to be on an annual basis, and because NMFS cannot enter into contracts without the funds available, some level of startup funding will be required. The amount of startup funding necessary depends on the type of contract used. If NMFS enters into annual contracts with observer providers, at least one-year's worth of contract costs would be required in advance. If contracts are established on a quarterly basis with an option for indefinite renewal, then startup funds equal to estimated first quarter coverage costs may be required, provided that the fee collection mechanism is timely enough to make first quarter fee collections available to NMFS at the start of the second quarter.

If startup funding in the form of a Federal grant proves unlikely, an alternative may be a Federal loan similar to that established to pay back the inshore pollock sector's portion of the buyout of nine catcher

processors retired under Section 209 of the AFA. Startup costs could be paid through fee proceeds over a longer period of time, such as the 20-year time period established for the AFA inshore fee program.

Federal funding also may be available to cover some or all of the ongoing direct costs of observer coverage under any of the alternatives. Again, it is not possible to speculate about the likelihood of obtaining Federal funds to subsidize coverage costs and the size of such a subsidy. This has been a subject of significant discussion during the past several years in the OAC meetings, and some participants contend that the issue is ripe for serious consideration. It should be noted that with the sole exception of the Pacific hake observer program, the North Pacific is the only region in which vessel owners are responsible for paying for the entire cost of required observer coverage. In all other regions, observer programs are fully funded with federal dollars. Therefore, some level of Federal funding for a restructured observer program seems reasonable.

4.8 Contracting process

In all of the alternatives under consideration (except status quo), private contractors would continue to be the source of observers deployed under the restructured program. The main difference from the current program is that NMFS would be the entity responsible for observer coverage rather than the vessel owner. Detailed regulations and procedures already govern the Federal contracting process. Therefore, this analysis does not examine alternatives to the process that would govern direct Federal contracting for observer services. Rather, the existing Federal contracting process is described to provide the Council and the public with an understanding of how the program would operate, should one of the action alternatives be adopted. This section also explores the role of contractors under a new program, and whether single or multiple contracts, and single or multiple contractors, are preferable.

NMFS is serviced for its contracting needs by staff in NOAA's Western Administrative Support Center (WASC) located in Seattle. While WASC provides the service, contracting is a shared responsibility with NMFS because it is incumbent upon NMFS to articulate what it needs in a contract, to provide funds, and to monitor technical progress. NMFS intends to contract for observer work because observer provider companies have demonstrated high competence and efficiency in completing this work in Alaska and throughout the U.S. Also, the contracting process allows for open competition which will keep costs controlled. In addition, past experience has shown that well managed contracts result in a cooperative effort between NMFS and the contractor. This fosters a "business partner" approach creating good working relationships and communications which help in developing a responsive, effective and efficient Observer Program.

There is a range of contracting options available to NMFS and developing contracts will be done through a consultative process with WASC to ensure the best service while providing for competitive pricing. The number of contractors and the responsibility for duties between contractors and NMFS will be dependent to some degree on the scope of the program chosen by the Council and how the various fisheries evolve (i.e. Gulf rationalization). At this time, NMFS envisions a minimum of two contractors and potentially more, depending on the overall scope of the restructured Observer Program.

4.8.1 Indefinite-Delivery, Indefinite-Quantity Contracts

NMFS has identified a type of Federal contract that may be appropriate for a restructured observer program. This type of contract is referred to as an indefinite-delivery, indefinite-quantity (IDIQ) contract under Federal Acquisition Regulations (Subpart 16.5). An IDIQ contract is a contract framework that identifies a body of work can be awarded to multiple vendors. Actual work under an IDIQ contract is done in response to specific task orders issued by NMFS for components of work. The task orders can be

awarded to any of the vendors who are under the IDIQ contract. An IDIQ contract has the advantage of increased flexibility and there are no requirements for start-up funding to initiate the IDIQ contract. However, issuing task orders under this IDIQ framework would require funding to cover that specific task order. IDIQ contracts permit flexibility in both quantities and delivery scheduling and in ordering supplies or services after requirements materialize. This aspect may prove advantageous since the details of observer coverage and funding may not be fully known when the newly restructured Observer Program is implemented. In addition, IDIQ contracting requires that preference be given to awarding multiple contracts under a single solicitation for the same or similar services. This will allow NMFS to benefit from the cumulative expertise of more than one observer company.

The following is a list of IDIQ contract attributes:

- According to Federal acquisition guidelines, if contract awards are multiple, the IDIQ contract is a good option compared to a system of separate contracts because it is a very flexible contracting model.

- No up-front money required. NMFS only needs to state the minimum and maximum amount to be paid to each vendor (observer provider) for the duration of the contract. IDIQ still requires up-front money for each task order. Task orders (work assignments) are developed as necessary. Selected observer providers bid on each task order.

- Under an IDIQ contract, a minimum of two successfully bidding observer provider companies will be awarded contracts. However, any number of bidding companies can be selected. There is no limit.

- Each observer provider awarded an IDIQ contract is guaranteed a minimum amount of work. The contract must state the minimum amount to be provided to each vendor under the total term of the contract. This amount will have to be paid whether or not the vendor is assigned any work.

- NMFS would need to develop an "Advanced Acquisition Plan" before awarding a contract. Each contract is different and the timeframe will be influenced by the monetary value and overall complexity of the contract. However, at a minimum, NOAA requires 224 days to write and award a contract valued from $100 thousand to $10 million and they require 239 days for a contract valued over $10 million. An advanced acquisition plan will be needed regardless of whether an IDIQ contract is chosen or not, because of the size and complexity of contracting for observer services. NMFS would need six months in advance of this schedule to prepare contract requirements.

- The Federal acquisition regulations state that if the government knows there are two or more responsible small businesses that can perform the work, the Government is required to award contracts to small businesses. Therefore, observer contract awards will most likely be to small businesses. Most existing observer providers are small businesses. The distinction between a small and large business depends on the North American Industry Classification Code (NAICS) cited in the solicitation. NAICS codes state the size of the business in either the maximum number of employees working for the company or in maximum amount of dollars earned.

- The contract award process will not consist of bidding on detailed work descriptions or task orders. Observer providers will either bid on more general categories in the offer schedule, such as observer coverage days, transportation, etc., or they may be requested to bid on general

modules of work (i.e. combinations of vessel types, gear types, fisheries, areas fished, etc.) After the contract is awarded, defined task orders will be created within the modules and assigned to the observer provider companies that were awarded the contract.

- Individual observer companies that are awarded an IDIQ contract with other observer companies are not *required* to compete for individual task orders. Individual task orders can be assigned to particular observer companies and the companies are obligated to do the work. However, NMFS recommends that each task order be competitively bid in order to keep costs as low as possible.

4.8.2 Additional tasks that lend themselves to contracting

Currently, the tasks necessary to operate the Observer Program are divided among NMFS, observer providers, and the fishing industry. NMFS trains observers, debriefs observers, and manages the information collected by observers. The observer providers recruit, hire, deploy, insure, and pay salaries of observers. They also compete with each other for industry business. Industry selects an observer provider to coordinate with their scheduling needs and supply observers to meet federally mandated observer coverage. They are also responsible for providing accommodations (room and board) to observers on their vessels, in their shore-side plants and on stationary floating processors.

Under a direct contracting system between NMFS and the observer providers, there is an opportunity to shift some of the aforementioned responsibilities. NMFS intends to continue to train, debrief, and manage the information provided by observers, as these are essential data quality control steps and NMFS will remain responsible for program and contract design. But additional tasks, dependent on the contract scope, may be included in the contract. For example, a different deployment scheme could require the contractor to maintain a system of tracking vessels so coverage decisions could be made by NMFS. Contractors would be directed to assign specific observers to specific vessels, fisheries, etc. For instance, NMFS may task contractors to match more experienced observers with vessels that pose more challenging sampling situations. Contractors could also take a larger role in the compiling and quality control of observer data. However, consideration must be given to possible conflict of interest concerns if the current pay-as-you-go model is applied to any segment of the industry, and any observer provider operates under both service delivery systems.

4.8.3 Contract design

To implement a contract, NMFS must develop a statement of work (SOW) which defines the type and scope of work to be accomplished. NMFS works with NOAA contracting to incorporate the SOW into a Request for Proposals (RFP) which is issued to the public. Interested vendors respond to the RFP with technical and cost proposals for the work described in the SOW. Proposals are evaluated and contracts are awarded to successful bidders.

NMFS expects that responses to an RFP for observer services will likely come from observer companies that currently provide observers to various NMFS observer programs around the country. NMFS recognizes that the existing observer provider companies are expert professionals in the field of supplying observer services, and because of this, the SOW in the contract will be as general as possible. NMFS feels that stipulating specific aspects of how to accomplish the work actually constrains creativity and responsiveness on the bidder's part and hinders the development of unique approaches to certain problems or aspects of the work. The total number of contractors, along with the division of duties between contractors and NMFS, will be dependent to some degree on the scope of the program chosen by

the Council and how the various fisheries evolve. However, NMFS envisions a minimum of two contractors and potentially more, dependent on the overall scope of the contract(s).

The scope of individual task orders will depend on which alternative is selected by the Council. To design individual task orders, NMFS will account for logistical issues, unique fleet characteristics, and the geographical and temporal extent of fishing, etc. Developing task orders will be a complex process that will occur after the alternative is selected by the Council and we have a group of contractors selected under a contract.

4.8.4 Discussion of contract benefits

Managing an observer program through direct contracts between NMFS and the observer providers offers advantages and disadvantages compared to the existing system. NMFS' perspective on the advantages and disadvantages of using a direct contract system is provided in the following two sections.

4.8.5 Contract Advantages

Government contracting for observer services is the norm for other NMFS observer programs, including the Alaska Marine Mammal Observer Program. The contracting process is objective, well defined, and provides for competition.

The following is a list of some of the advantages of direct government contracting:

- Professional contract management assistance and support from WASC.
- Contracting would replace most of the cumbersome regulatory processes used to manage observer providers under the current system. Contractors would be held accountable for their performance through the contract rather than through regulatory enforcement.
- The workload under any task order will be clear and will improve contractor efficiency and facilitate planning.
- The work required of the contractor could be changed, if needed, through issuing new task orders rather than through regulatory amendments.
- Direct contracting funded through a fee system would eliminate the regulatory burden on industry to acquire its own observers. Vessels and processors would only be required to carry observers when they are provided by NMFS.
- Contractors will be directly responsible to NMFS for data quality and the work of observers.

4.8.6 Contract Disadvantages

- The market share of the work may be redistributed among contractors.
- Under Alternatives 2-6, NMFS will need to address complex crossover issues detailed in Section 4.9.
- The development and management of contracts would require additional NOAA staff resources.

- Some additional requirements would be placed on industry, such as providing advance notices of fishing schedules.

4.9 Crossover issues: Administering two separate programs under Alternatives 2 through 6

Alternatives 2 – 6 would restructure the observer program for a segment of the fleet while leaving the existing system in place for another part of the fleet, thus creating a hybrid Observer Program. There are a number of issues related to interactions between the different components in a hybrid Observer Program. Foremost among these issues is the degree to which interactions would be allowed. Allowing interactions between the two programs has the potential to overly complicate and possibly erode the benefits of the new system.

The following sections outline the potential interactions between and effects of two systems in a hybrid program, one based on Federal contracts for observer services and the other implemented through regulations similar to those currently in place.

4.9.1 Data Quality Issues

Many factors influence the quality of data provided by observers. Some of these factors are independent of the service delivery model and/or may not be exacerbated under a hybrid program. These include such factors as access to catch (to allow for correct random sampling) and overall quality of observer training. Other quality factors are directly attributable to aspects of the service delivery model and/or may be exacerbated under a hybrid system. Since broad concern regarding observer data quality is highlighted in the Council's problem statement, the following discussion considers three such factors and provides a discussion on concerns relative to these factors under the current system, under a restructured program which is supported by a single direct-contract based service delivery model (Alternative 7) and under a hybrid program (Alternatives 2 - 6). These three factors are: 1) deployment of observers in less than 100% covered fisheries, 2) matching observer skill level with deployment flexibility, and 3) managing contractor and observer performance to optimize overall data quality.

Deployment of observers in less than 100% covered fisheries

Under the current service delivery model, NMFS is unable to direct deployment of observers on vessels which are allowed to have less than 100% observer coverage. This leads to a number of data quality issues including bias associated with non-random placement of observers and inadequate coverage of some sectors. These concerns are problematic at present and are expected to become increasingly troublesome under options under consideration for rationalization of GOA groundfish fisheries. As discussed earlier in this document, the cornerstone of a restructured observer program will be the provision of a mechanism to allow NMFS to determine where and when observers should be deployed in those sectors covered by the new service delivery model.

Matching deployment complexity to observer skill and experience level

Requirements for sampling by observers vary according to vessel, gear type, and target fishery. For example, monitoring and sampling onboard a pollock catcher vessel is straightforward, whereas sampling on some of the small "head and gut" factory trawlers can be extremely challenging. Observer skill levels differ, and depend on experience and other factors. Observer effectiveness and efficiency, and overall data quality would be best served under a system which allows NMFS to develop observer skills

progressively by first deploying them in less challenging situations, or at locations where they can be mentored by experienced observers or NMFS staff. As they become more experienced and skilled, they could then be deployed in more complex and challenging sampling environments and could, in turn mentor newly-trained observers. It is not possible to implement this approach under the current service delivery model. Under a hybrid model, possibilities for implementing this approach would be very limited because those fisheries which are the easiest to observe would operate under a different service delivery model than many (or most) other fisheries. This approach can only be fully implemented under Alternative 7, which would provide the flexibility necessary to properly match deployment complexity with observer skill level in all observed fisheries, and to implement a mechanism to develop observer skills consistent with the overall requirements for observers.

Managing contractor and observer performance to optimize overall data quality

An effective service delivery model should provide incentives for contractors and observers to deliver high quality data and disincentives for failing to meet data quality standards. Provisions for terminating observers or contractors who demonstrate egregious violations of standards (or less drastic corrective action under less serious circumstances) would provide an important tool for use in unusual circumstances and would also, in itself, provide a powerful disincentive. Data quality is, to a large extent, dependent on the commitment, professionalism, and effectiveness of observers. NMFS would ensure that the necessary provisions are implemented in contracts established between NMFS and observer providers in a restructured program. NMFS is unable to implement these types of provisions under the current service delivery model because there is no direct contract between NMFS and the observer providers. NMFS would also be unable to do so for sectors that continue to operate under the current service delivery model in a restructured program. Under a hybrid system, observers and observer contractors who fail to meet data quality standards while operating under direct contract to NMFS would be subjected to penalties according to contractual provision. Those penalties could not, however, constrain their ability to act as observers or deliver observer services in fisheries where observer coverage and data quality is managed by regulation. Observers and contractors who fail to meet data quality standards in one element of the program could, therefore, be allowed to continue to provide these services in the other element. This possibility is not consistent with the goal of improving overall observer data quality.

4.9.2 Financial control

Under a Federal contract, the contractor would bill NMFS for the services it provides under the contract, including such costs as observer and staff salaries, travel, and housing. Under the existing system, these costs are billed directly to the industry as specified in contracts between observer providers and fishing companies. NMFS is not a party to these contracts and does not have access to financial information regarding either participant. Under a hybrid program, some contractors may be providing observers under contract to industry and under contract to the agency. This arrangement may not be tenable and it may be necessary for the agency to preclude this possibility by preventing contractors from entering into contracts under both systems with the same entity. Under these circumstances, it would be very difficult for the government to verify that invoices received from contractors cover only services provided to the government and do not include some costs that should be borne directly by the industry. This concern would be exacerbated in cases where contractors are providing observers to one fishing company under both types of contractual arrangements. It would be essential for NMFS to develop mechanisms to prevent double billing or charging the government for services provided under a contract with industry (or vice versa). This would likely require substantially increased financial reporting requirements for industry and increased auditing responsibilities for the agency.

4.9.3 Management of a Hybrid Observer Program

NMFS has identified a number of complex issues which will be difficult to resolve under a hybrid program. NMFS is committed to working with the industry and other agency entities to seek resolution to these issues. However, to maintain the integrity of the overall program, it may become necessary to administer and manage each program element independently. This will likely result in significantly increased administrative costs. Further development of these issues will be provided for future iterations of this analysis.

4.10 Enforcement issues

The role of NMFS Enforcement in enforcing observer regulations will change dramatically under all of the action alternatives. Under the current program, NMFS Enforcement has several primary observer-related enforcement duties. These include:

- *Enforcement of 30%, 100%, and 200% coverage requirements for vessels and processors.* Because the owners and operators of vessels and processors are responsible for obtaining their own coverage, the opportunity exists for vessel operators to evade their required coverage. This opportunity is greatest in the 30% fleet because it is not possible to determine whether a particular vessel or processor has violated a coverage requirement until the end the quarter, and then only by a comprehensive audit of vessel fishing logs and observer coverage reports. In the 100% and 200% coverage fleets it is immediately obvious if a vessel is violating a coverage requirement because NMFS would be receiving catch reports from a vessel that has no observer on board.

- *Enforcement of recordkeeping and reporting requirements.* While many recordkeeping and reporting requirements do not directly relate to observer coverage, vessel reports of fishing activity are generally used to determine if the vessel is in compliance with coverage requirements.

- *Enforcement of regulations governing the treatment of observers by vessel operators and crew.* NMFS has strict regulations addressing harassment and interference with observers. NMFS Enforcement plays a leading role in ensuring that observers are protected from harassment and interference.

- *Investigation of reports of fishing violations made by observers.* During the course of a fishing year, the hundreds of observers deployed off Alaska generate numerous affidavits reporting violations of fishing regulations and other marine conservation regulations such as MARPOL. NMFS Enforcement spends a considerable amount of time prioritizing, investigating, and taking action on these reports by observers.

Under the action alternatives, vessel operators would no longer be responsible for obtaining their own observer coverage. Vessels would be required to carry observers when requested to do so by NMFS in the Tier 3 and 4 fisheries. Therefore, Enforcement would no longer need to track coverage levels on individual vessels to determine if the required coverage is being met. While this would relieve NMFS Enforcement of one significant observer related duty, the action alternatives introduce their own enforcement issues. These include:

- *Enforcement of the requirement that a vessel carry an observer when requested to do so by NMFS in Tier 3 and Tier 4 fisheries.* In these fisheries, the majority of vessels are likely to be fishing without observers while NMFS directs coverage to certain vessels based on the agency's

sampling plan and priorities. At some point, specific vessels may resist requests by NMFS to carry observers, at which point NMFS enforcement may be required to take action.

- *Enforcement of check-in/check-out requirements and/or electronic fishing log reporting requirements.* Effective deployment of observers in Tier 3 and Tier 4 fisheries would require that NMFS receive accurate information from each vessel owner or operator about when and where the vessel would fish. Enforcement actions may be necessary when vessel operators fail to report in a timely and accurate manner.

Under the action alternatives, NMFS Enforcement would need to continue enforcing regulations protecting observers from harassment and interference, and would continue to investigate reports of fishing violations by observers. These enforcement-related tasks are unlikely to change significantly relative to the status quo.

List of References

Australian Fisheries Management Authority (AFMA). 2004. "A guide to electronic catch and effort logbook reporting." Online document found at http://www.afma.gov.au/services/data/electronic/about.php

DOL. 2002. "Prevailing Wage Resource Book." U.S. Department of Labor, Employment Standards Administration, Wage and Hour Division, November 2002. 253 pp.

NMFS. 2004. "Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement." U.S. DOC, NOAA, NMFS, Alaska Region, P.O. Box 21668, Juneau, AK 99802-1668.

NMFS 2003 "Alaska Groundfish Fisheries Draft Programmatic Supplemental Environmental Impact Statement." U.S. DOC, NOAA, NMFS, Alaska Region, P.O. Box 21668, Juneau, AK 99802-1668.

NMFS 2001. "Steller Sea Lion Protection Measures Final Environmental Impact Statement." U.S. DOC, NOAA, NMFS, Alaska Region, P.O. Box 21668, Juneau, AK 99802-1668.

NMFS. 2000. Guidelines for Economic Analysis of Fishery Management Actions. Office of Sustainable Fisheries, National Marine Fisheries Service, Silver Spring, Maryland 20910.

NMFS. 1998a. Final Supplemental Environmental Impact Statement: Groundfish Total Allowable Catch Specifications and Prohibited Species Catch Limits Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska. December 1998. National Marine Fisheries Service, P.O. Box 21668, Juneau, Alaska 99802. 692 pp + Appendices and Comments.

Rohlf, D. J. 1989. "The Endangered Species Act, A Guide to its Protections and Implementation." in Stanford Environmental Law Society, Stanford Law School, Stanford, CA 94305. 207 p.

List of Preparers

Kent Lind (NPFMC)
Nicole Kimball (NPFMC)
Joe Terry (AFSC)
Terry Hiatt (AFSC)
Jason Anderson (NMFS-Alaska Region)
Martin Loefflad (AFSC)
Bob Maier (AFSC)

List of Persons Consulted

Dave Edick (Alaskan Observers)
Jonathan Cusick (West Coast Observer Program)
Sharon Kent (WASC)
Judi Jzyk (WASC)
Tracy Buck (RAM, AKR)
Troie Zuniga (OMI, AKR)
Alan Kinsolving (NMFS AKR)

Appendix I

Fisheries Monitoring Technologies

A Project Report Submitted to

North Pacific Fishery Management Council

by

MRAG Americas, Inc.
110 S Hoover Blvd., Suite 212
Tampa, Florida 33609-3415

April 2004

Report prepared by Robert J. Trumble, MRAG Americas, Inc., Tampa FL, Mark Kaiser, Iowa State University, Ames IA, and Graeme Parkes, MRAG Ltd., London UK.

1 Introduction

1.1 Background

Groundfish fisheries in the North Pacific make extensive use of observers onboard fishing vessels. Trawl and longline vessels over 124 feet in overall length have at least one observer on board at all times. Vessels between 60 and 124 feet and pot vessels longer than 124 feet in overall length carry observers for 30% of their fishing days. Vessels less than 60 feet long are not required to carry observers. Observers estimate total catch for a portion of the hauls or sets, and sample those hauls or sets for species composition. Extrapolations from these data are used to make estimates of total catch by species for observed vessels; catch estimates for unobserved catcher processors are based on weekly production reports, and on fish tickets for unobserved shoreside deliveries. Observer data are treated as if representative of all vessels, both observed and unobserved, and are used to estimate total catch of prohibited species for the entire fishery. However, National Marine Fisheries Service (NOAA Fisheries) has concerns that the observed data are not representative of unobserved vessels. Some fisheries, including most in the Gulf of Alaska, have a significant number of unobserved vessels.

A number of factors are known that could bias observer data and hence the catch estimates based on them. There is no way to deploy an observer on a commercial fishing vessel without the vessel operator being aware of the presence of the observer, and possibly changing fishing behavior as a result. This gives rise to a so-called "observer effect" (see also Section 4.3). This may occur either on unobserved vessels relative to observed vessels, or during unobserved hauls of otherwise observed vessels. To the extent that vessels fish differently when being observed, observer data provide a biased sample of the entire fishery. In addition, if the observer coverage itself is non-random with respect to the vessel fleet, the sample taken may not be representative of all vessels. For example, larger vessels may fish gear that has different catching characteristics than similar gear used by smaller vessels.

Examples of changes that are thought to occur when observers are onboard include: 1) avoiding localized areas of high bycatch; 2) rigging gear differently; 3) changing average haul duration or gear soak time; and 4) different behavior on observed and unobserved hauls. In extreme cases, vessels have been known to deploy gear in areas where commercial fishing does not normally occur or to deploy gear for very short periods of time simply to obtain credit for a day of observer coverage. Use of VMS data may provide insights into vessel behavior with and without observers, but other than this, it is difficult to quantify the bias in observer data without some form of experiment, which may itself be confounded by similar problems of non-typical vessel behavior.

1.2 Purpose of this study

The National Marine Fisheries Service (NOAA Fisheries) and the North Pacific Fishery Management Council (NPFMC) want to investigate catch and vessel monitoring technologies that can be used to augment observer programs, increase accuracy of data collected by observers, and potentially replace some observers to improve the level of confidence in catch data.

Specifically there is a desire to collect data necessary for individual quota or cooperative programs without significantly increasing observer coverage.

This report reviews applicable technologies and current examples of their use and includes information describing example technologies, the ways that each technology can be applied to the catch monitoring problem, costs, and availability. The report also considers how individual technologies could be integrated into a catch monitoring system, with emphasis on applicability to the Gulf of Alaska and Bering Sea/Aleutian Islands fisheries. The report highlights technologies suitable for filling existing data gaps – such as groundfish bycatch in the Pacific halibut fishery and bycatch in fisheries dominated by small vessels not currently subject to observer coverage.

Candidate technologies fall into two broad categories: 1) technologies to monitor catch quantity and/or composition directly; and 2) technologies to monitor characteristics of fishing activity that may provide predictors for catch quantity and/or composition. Technologies in the latter category are also expected to assist with identification and quantification of bias resulting from different behaviors of observed and unobserved vessels.

Technologies involved in direct monitoring of the catch include cameras placed at strategic locations on the vessel, and the installation of digital motion-compensated scales (Section 2). In cases where direct monitoring technologies are not an option, monitoring the characteristics of fishing activity that may provide predictors for catch quantity and/or composition provides an alternative and possibly less intrusive approach to solving the problem. For example, bycatch rates may be inferred from gear type and configuration, location (monitored through a vessel monitoring system (VMS)), depth of fishing, etc. (Section 3).

Section 4 of the report considers the computing and statistical requirements to process and conduct analyses of data collected using the technologies described in Sections 2 and 3. Section 5 considers individual or combinations of monitoring techniques with computing and analytical capabilities to make or improve determinations of fishing activities relevant to fisheries management. Section 6 draws conclusions and recommendations.

2 Monitoring catch composition and catch quantity

2.1 Cameras

2.1.1 Catch monitoring with observer analysis of video images

Archipelago Marine Research, Ltd. (AMR), based in Victoria, British Columbia, has a functioning electronic monitoring (EM) system using video recording to identify and enumerate fish by species aboard commercial fishing vessels (McElderry et al. 2003). In 2002, Fisheries and Ocean Canada (DFO) implemented 25% observer coverage of days at sea for the Canadian Pacific halibut fishery, which uses bottom longlines, primarily to monitor bycatch of rockfish and protected species. Cost, bias, and equity issues for the current program arose because of

costs to individual vessels of about CDN $300 per observer day (and an additional CDN $130 per observer day funded by the Federal government) and because most vessels are less than 40 ft long. In response, AMR, which had conducted a pilot electronic halibut monitoring program in 2001, arranged with DFO and the Pacific Halibut Management Association for a voluntary expanded electronic monitoring program. Electronic monitoring equipment was placed on board observed vessels with target coverage of 10% of all trips, concurrent with required on board observers. The program was designed to evaluate the technical performance of electronic monitoring as a monitoring tool, to compare electronic monitoring and observer data for species identification and fishing effort, and to compare costs, benefits, and operational issues of observer-based and electronic monitoring programs.

The AMR video-based electronic monitoring system (Figure 1) (McElderry et al. 2003) consists of the following components:

- Operating system and data storage – A lockable, tamper-proof box contains the operating system, data storage components, and power supplies for the video camera and peripheral vessel sensors. The two primary components in the control box are the video computer and data logging computer. The video computer digitizes the incoming analog camera signal and stores the video imagery on removable computer hard disks. The data logging computer concurrently captures and records the output from the GPS, pressure sensor, and drum rotation counter. Software on the data logging computer can be set to activate the video system whenever the sensor data recognize specific fishing activities (hydraulic pressure increase or drum rotation).
- User interface – A small monitor and keyboard provide basic system status information and allow user input.
- GPS receiver – An independent GPS receiver connected to the control box delivers a digital data stream for time, vessel position, speed, and heading.
- Winch sensor – A sensor mounted on the winch detects and counts drum rotation.
- Hydraulic pressure transducer – An electronic pressure transducer mounted on the supply side of the hydraulic pump system records hydraulic pressure, and by inference, work by devices such as winches or line haulers.
- Cameras – Two closed-circuit TV cameras provide imagery of the retrieval area during longline hauling operations. The cameras are standard resolution color (350 lines per screen) with a light sensitivity of 0.8 Lux at F 2.0.

The AMR system does not transmit data in real time, although time-sensitive data (such as compliance issues) can be sent in real time. While technically feasible, transmitting the high volume of EM data in real time was deemed to be economically impractical. All EM data became available to AMR at the end of each trip.

AMR installed the EM system on vessels for specific fishing trips and removed it afterwards. Suitability of the EM equipment was demonstrated on a wide variety of halibut fishing vessels, including a few vessels not suitable for observers (McElderry et al. 2003). The EM equipment had no significant data loss for about two-thirds of the fishing trips on which it was deployed. The newness of the system for the halibut fleet, installation problems, and changes in equipment to improve the system contributed to rate of data loss. Movement of ground line out of the camera field of view, low light conditions, and loss of power resulted in data deemed not useable. AMR expects successful deployments to exceed 90% for future monitoring of the

Canadian Pacific halibut fleet, because few further changes in equipment are expected, and because of increased familiarity with installation procedures by the fishermen and the AMR technical staff. Permanent installation on vessels would likely increase the rate of successful data collection even further.

The data logging computers are retrieved following a fishing trip and returned to AMR for analysis (McElderry et al. 2003). Trained observers view the video images and enumerate catch by species by hook. Total catch estimates from the video imagery were within 2% of at-sea observer catch estimates for about 150 successfully monitored sets (about 80,000 hooks) over the 9-month fishing season. McElderry (in Cusick et al. 2003) evaluated the EM results against at-sea observers for several attributes, and scored the ability of electronic monitoring and observers for these attributes (**Table 1**) on a scale of zero (low) to five (high):

- Video-based EM reliably identifies catch to general groups with consistent morphological features. Errors were predominantly within rather than between morphological groups. The evaluation identified species as High Recognition (<5% difference of EM results from at-sea observer results), Moderate Recognition (<10% difference), and Low Recognition (>10% difference) species (**Table 2**). High recognition species accounted for 77% of the catch in the electronic monitoring study, and estimated as 92% of the catch in the overall halibut fishery. Moderate recognition species accounted for 17% of the catch in the electronic monitoring study, and estimated as 5% of the catch in the overall halibut fishery. Low recognition species accounted for 5% of the catch in the electronic monitoring study, and estimated as 3% of the catch in the overall halibut fishery. Twenty three species (2% of the catch in the study) were not encountered in sufficient numbers to compare electronic monitoring. Overall scores for species recognition: EM – 3, Observer – 5
- Video-based EM is a reliable catch and hook enumeration tool for longline vessels. Overall catch comparisons between the electronic monitoring and observers were within 3% for number of catch items, and 5% for number of hooks and catch items combined. EM provided equivalent or better results than using observers because of observer fatigue during retrieval, the possibility of observers missing discards, and the opportunity for repeat viewing of the video record. Overall scores for catch and hook enumeration: EM – 5; Observer – 4
- The AMR EM system did not address catch weight. However, counts from EM could be converted to weight estimates by obtaining average weight by species through dock-side monitoring, and applying the average weights to the counts by species. Overall scores for catch weight[1]: EM – 0; Observer – 4
- Species disposition estimates by EM and observers were in close agreement for all species except halibut and longnose skate. The EM reliably distinguished catch sorted at the rail, but could not easily distinguish catch brought onboard and sorted later. Overall scores for catch disposition: EM – 3; Observer 5
- EM provides accurate information on time and location of fishing activity. Electronic monitoring captures geo-positioning information the same way for every haul, while observers may miss the start or end of a set because of conflicting duties. Overall scores for time and location: EM – 5; Observer – 4

[1] Errors in converting counts to total weight caused by blood loss, fluid loss or parts loss should be evaluated against observer errors in estimating catch. Use of dockside weights assumes no delivery size bias or high grading.

- The AMR EM system extrapolated depth from an electronic chart database. Agreement between EM results and observers decreased at greater depths with lower sounding rates. This method would not be adequate for monitoring compliance with depth restrictive regulations. However, it will improve as the accuracy of electronic charts increases, and EM could provide depth records directly by capturing data from the echo sounder on the data logging computer (see Section 3.5). Overall scores for fishing depth: EM – 3; Observer 5

McElderry (in Cusick *et al*. 2003) also compared programmatic issues of electronic monitoring and at-sea observer programs (**Table 3**), and concluded that the fishing industry tended to support electronic monitoring over at-sea observers, but that at-sea observers had higher versatility and provided more believable data. The general public, stakeholders, and fishermen tend to have suspicions concerning technology, and prefer to believe results obtained by humans (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). They see more opportunity for fishermen to avoid scrutiny from technological means than from observers, although fishermen can and do hide activities from observers.

The amount of time that a video analyst can work in a day depends on the complexity of the data analyzed (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). Analysts for AMR usually worked 4 hours per day on video images, with a maximum effective time of about 6 hours per day. The time required to analyze an individual fishing trip depends on a number of days fishing, number of fishing events, fishing location (concentrated or spread out), weather, and performance of sensors (McElderry *et al*. 2003). Electronic monitoring of the Canadian Pacific halibut fishery occurred on 59 vessels that made 697 sets over 459 sea days. Time spent by observers on other duties while not at sea is not included. Thirty fishing trips accounting for 391 sets had both EM and on-board observers. Processing video records from a fishing trip required 815 hours (102 days), much less time than observers would spend aboard the vessels. EM data required about a week following a trip to be processed for subsequent analysis. The resulting per vessel cost of an EM system is substantially less than the cost of at-sea observers. The video-based EM system cost about CDN$210 per vessel per day, less than half the total cost (fishermen cost plus government cost) of at sea observers, and about two-thirds of the cost to fishermen for at-sea observers. About three-quarters of the cost for the EM system covers the labor to install and service the equipment and to analyze and produce the data from the system. Future cost reductions may be possible through strategies to improve efficiency and manage labor costs.

The Pacific halibut video monitoring that identified and enumerated individual fish was more labor intensive than most EM projects conducted by AMR (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). Intensity increases with the number of fish per hook (hook population) and the species diversity. Fish occurred on about one third of the hooks in the halibut monitoring, six species accounted for about 75% of the catch, and the dominant species had mostly different morphology. Overall, analysis took about 0.75 of real time. In some pelagic longline fisheries, the hooking rate is about 5%, and therefore less-complex than in the halibut fishery. Rockfish fisheries have much higher species diversity and fish with very similar morphology, which is more complex than the halibut fishery.

EM projects that do not identify and enumerate individual fish take much less analytical time (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). Analysis of video monitoring to confirm that vessels complied with full retention requirements, with species identification and biological sampling on the dock, proceeded much faster than the halibut fishery enumeration. Analysis took about 0.3-0.5 of real time. Simpler yet, video confirmation of effective deployment of seabird avoidance devices on longline vessels required about 0.05 to 0.10 of real time. Monitoring of a Canadian fishery on seamounts to confirm the location of fishing and that vessels did not offload any fish at sea required only a few hours for trips that lasted 30-40 days.

2.1.2 Catch monitoring with digital recognition of species

Since the late 1990s, attempts have been made to develop a computer system that can identify species automatically through digital recognition. Such a system would identify fish to species level *in situ* from video pictures taken by digital cameras onboard fishing vessels (Davis 2002; Mark Buckley, Digital Observers, Kodiak, AK, pers. comm.). Fish species can already be identified successfully through a combination of cameras and image recognition software, but only under controlled conditions. At present this technology does not work adequately under actual fishing conditions. Computer software cannot currently identify fish species in actual fishing operations to acceptable levels for any gear type (Mark Buckley, Digital Observers, pers. comm.). Too many lighting variables occur for the image recognition to consistently identify fish species, and shadows apparently confound the recognition (Davis 2002). As the technology develops, longline fisheries are likely to be best suited for this approach because the fish come on board one at a time. The volume and flow of fish on trawl vessels is likely to preclude automatic fish identification *in situ* for the foreseeable future.

The computer software programs that converted video images into species identification used neural nets, types of computer applications wherein a computer is configured to imitate information processing by the human brain. Data are structured not by a central processing unit but by an interlinked network of simple units called artificial neurons. The artificial neurons receive inputs, process the inputs, turn the processed inputs into outputs, and interface with other neurons. Rather than being programmed, neural nets learn to do tasks through a training regimen in which desired responses to stimuli are reinforced and unwanted ones are not. Neural nets were first proposed in the 1940s and the subject of intensive research in the '80s and early '90s[2]. However, capability of neural nets has not developed to a state that computerized recognition of fish species can perform as well as humans.

2.1.3 Work in development and application to other fisheries

Controlled lighting increases the probability that video and computer systems could provide automated species ID. Digital Observers is developing a system that provides controlled lighting conditions on board trawl catcher-processor vessels through use of a “light box” (Mark Buckley,

[2] For more information on neural nets, see http://www.shef.ac.uk/psychology/gurney/notes/index.html.

Digital Observers, Kodiak AK, pers. comm.). The digital camera will capture images as fish pass singly, in a line (not side by side) over a translucent belt with lighting that eliminates shadows. Because the camera will be a known distance from the belt, the length of fish can also be estimated. Length measurements could be converted to individual weights through a length-weight relationship. The volume and flow of fish on trawlers limits sampling to only the subsample of the catch that can through the light box. Experiments scheduled for the spring of 2004 will test the system and obtain data needs for further development. Future work is aimed at investigating the rate of fish that can be processed through the light box, whether the system can be automated, whether it can function effectively without observers, and the likely sample sizes that can be achieved. This will show whether the system is likely to be a viable sampling tool that could enhance or supplement observer coverage.

Because automated digital recognition of fish species is currently impractical, Digital Observers is also working on a system of video and human reviewers for species ID. A completed system is expected during 2004 (Mark Buckley, Digital Observers, Kodiak AK, pers. comm.). The electronic video monitoring system will be generally similar to that developed by AMR, using GPS to locate the sets, and a simple rotation sensor that detects when the block is hauling the longline. Signals to the central computer trigger the computer to begin capturing images as the longline is hauled back onto the boat, and the computer settles back to 'resting' mode when signals stop. The Digital Observer system will use digital cameras, rather than analog cameras used by AMR. Future tests will evaluate whether the digital cameras offer benefits commensurate with the additional costs compared with analog cameras.

While automated identification of fish species under fishing conditions using camera technology is problematic, sea birds and marine mammals have unique characteristics that could make the technology more applicable. The occurrence of marine mammal and seabird bycatch is relatively rare as a proportion of total fishing effort, making adequate sampling difficult. Monitoring with cameras offers a mechanism to increase the coverage of fishing effort and subsequent sampling of these animals.

The various gears used in Alaskan waters have different bycatch characteristics, including rates of bycatch, vulnerability of species to the gears, and amounts of effort by gear type. Of the marine mammal bycatch, approximately 70% occurs during trawl fishing (http://www.nmfs.noaa.gov/prot_res/readingrm/MMSARS/2002AlaskaSARs.pdf). Longlines account for about 26% and pots for about 4% of the marine mammal bycatch. Of the seabird bycatch, approximately 65% occurs during longline fishing (http://www.afsc.noaa.gov/refm/docs/2002/ecochap.pdf). Trawls account for about 34% and pots about 1% of the seabird bycatch. Therefore, in terms of total bycatch enumeration for marine mammals and seabirds, monitoring of trawl and longline vessels has a relatively higher priority than monitoring of pot vessels.

Because bird and mammal bycatches are relatively rare, crewmembers could position birds and dead mammals for a camera in a way to enhance identification without major disruption to fishing activities. However, crewmembers could also discard the animals unseen unless a camera system surveys the entire deck with sufficient coverage to prevent blind spots. A camera that surveys the deck to prevent unauthorized discarding by the crew may also be used to identify live

mammals that the crew cannot position under a close up camera. Even if positioned well for the camera, digital recognition of these species may still be problematic. Animals caught on longlines or in pots are likely to experience predation by amphipods (sand fleas), crabs, and other benthic scavengers, which may destroy vital identifying characteristics. Animals caught during deployment of trawls may also suffer damage that would diminish the ability of the computer to identify them through digital recognition. Human reviewers of the digital recordings may identify these animals more successfully.

Experiments conducted in Hawaii suggest that infrared cameras could be used to identify marine mammals and seabirds swimming near vessels (Scientific Fisheries Systems 2003). The warm-blooded animals provide infrared images visible against the colder seawater background. The experiments were hampered by the rarity of the target species, Hawaiian Monk seals, dolphins, and albatrosses, which did not provide enough samples. Five Monk seal images, three dolphin images, and 18 albatross images were used for the preliminary discrimination study. Preliminary results using a Principle Component Analysis did not show a clear distinction among the three species, but showed some degree of separation. Albatrosses generally occurred within a cluster, but the clusters for the other species could not be identified. Monk seals tended to separate from albatrosses, but dolphins overlapped both Monk seals and albatrosses. Further progress on this methodology would require a larger data set, especially of Monk seals and dolphins.

Any system that can identify fish could potentially be used to obtain information on the species identification of an unsorted fish bycatch. Limitations on fish identification would apply to bycatch identification. However, camera systems cannot obtain biological samples. Light boxes may not work for large species such as Pacific halibut, and rare species may require large samples for the system to make accurate and precise counts.

Due to their relatively clean catch and low discard rates, pot vessels may provide a good opportunity for electronic video monitoring of species composition of the catch. Pot vessels in Alaskan waters generally target Pacific cod, which form the main component of their catch with relatively small amounts of discards (Kent Lind, NOAA Fisheries, Juneau AK, pers. comm.). If the requirement for full retention of Pacific cod results in accurate weighing and measuring of retained catch at the processor, then a camera system could focus on the monitoring of discards. A camera to monitor the deck could check for unauthorized discards, and a camera to monitor the discard chute could collect information for subsequent analysis by humans. A belt or track, down which for discards could pass singly by the camera, would enhance species identification of discards. AMR conducted pilot programs for video monitoring of pot fisheries for British Columbia sablefish and prawns fisheries in 2002 and 2003, respectively (Howard McElderry, AMR, Victoria, BC, pers. comm.). These pilots demonstrated the necessity of a “control point” through which all fish must pass to assure that no fish miss detection. Close up views of the control point provided for monitoring and counts of the fish.

The light box in development for trawl catcher-processors would not be suitable for the open decks of most pot vessels, but could work for the several catcher-processor pot vessels.

2.2 Motion-compensated scales

2.2.1 Current Requirements

Flow scales approved by NOAA Fisheries (http://www.fakr.noaa.gov/regs/default.htm) can weigh a continuous flow of raw material and give a steady raw material throughput. Fish pass from holding tanks via conveyor belts to the flow scales, which provide fully automatic weighing. Every piece of raw material is weighed with the conveyor belt running and weighing results are added up to a total (http://www.marel.com/02000/2100_w/dwu-mpfl.asp, http://www.scanvaegt.com/Files/Filer/Extranet/Marketing/Leaflets/Processing%20Equipment/ScanFlow_Int.pdf). Depending on the model, flow scales range in size from 1450-1900 mm long by 300-900 mm wide, and can weigh 40 –100 tons per hour.

To verify that the scale performs better than the maximum permissible error (plus or minus three percent the known weight of the test material), the vessel operator must test each scale or scale system used to weigh total catch one time during each 24-hour period when use of the scale is required. A material test must be conducted by weighing at least 400 kg of fish or an alternative material supplied by the scale manufacturer on the scale under test. The known weight of the test material must be determined by weighing it on a platform scale approved for use. Vessel operators must notify observers in advance of scale tests and conduct the tests in the presence of an observer. The vessel owner must ensure that these tests are performed in an accurate and timely manner.

Although regulations allow errors up to 1% during annual testing of the scales, errors rarely exceed 0.25% (Alan Kinsolving, NOAA Fisheries Alaska Region, Juneau AK, pers. comm.). The scales drift over time as belts stretch or load cell age. Fishermen have an incentive to correct the scales if they overestimate weight, but not to fix them when they underestimate weight. Regulations allow up to 3% error during daily test. Alan Kinsolving (NOAA Fisheries Alaska Region, Juneau AK, pers. comm.) estimates that the average error found during the daily tests is on the order of 0.5% underestimate. While tampering with the scales is possible, no clear evidence exists for tampering. No cases of tampering have gone to court.

The following sections from the Alaska Region fishing regulations specify flow scale requirements (http://www.fakr.noaa.gov/regs/default.htm):

679.32(c)(4)(iv) CDQ catcher/processors using trawl gear and motherships (effective through December 31, 2007). The operator of a catcher/processor using trawl gear or of a mothership taking deliveries of unsorted codends from catcher vessels must weigh all catch on a scale that complies with Federal requirements. A valid scale inspection report must be on board the vessel at all times when a scale is required. Catch from each CDQ haul must be weighed separately. Catch must not be sorted before it is weighed, unless a provision for doing so is approved by NOAA Fisheries for the vessel in the CDQ. Each CDQ haul must be sampled by a level 2 observer for species composition and the vessel operator must allow level 2 observers to use any scale approved by NOAA Fisheries to weigh partial CDQ haul samples.

679.63(a)(1) (1) Catch weighing. All groundfish landed by listed AFA catcher/ processors or received by AFA motherships must be weighed on a NOAA Fisheries-certified scale and made available for sampling by a NOAA Fisheries certified observer. The owner and operator of a listed AFA catcher/ processor or an AFA mothership must ensure that the vessel is in compliance with the Federal scale requirements for Alaskan waters, that each groundfish haul is weighed separately, and that no sorting of catch takes place prior to weighing.

2.2.2 Work in development and application to other fisheries

Motion-compensated hopper scales may also be suitable for obtaining total weight of catch on catcher processor longline vessels. In 2003, NOAA Fisheries conducted an experiment on a Pacific cod freezer longline vessel to test observer estimates of total catch and the estimate of total catch made by the vessel compared to an actual weight (Doug Limpinsel, NOAA Fisheries, Seattle, pers. comm.). The experiment used a Marel motion-compensated hopper scale, which is a smaller version of ones used in shore plants, to weigh the catch on board the vessel. Analysis of the data comparing observer and vessel estimates are underway, and no results are yet available. However, the hopper scale performed well and provides a useful tool for measuring total weight.

The control unit for the Marel hopper scale used by NOAA Fisheries for experiments has a computer link for control of feeding fish to the scale and for storing data. For the experiment, an automatic hook stripper removed fish from the hooks, and dropped them on a conveyor belt that carried them into the hopper scale. A computer tracked the weight of fish in the hopper and stopped the conveyor at a target weight of approximately 100 kg. The computer logged the weight of fish in each hopper load, and dumped the fish onto another conveyor to continue processing. The scale was located in the factory. Marel has recently introduced a new version of the control unit, the M2200, which has an internal IP address useful for data logging.

Marel has several hopper scales of a size that could work on longline or pot catcher-processor vessels. However, the hopper scales are not suitable for use on an open deck, so their use would be limited to covered areas comparable to those found in catcher-processor factories (Birgir Johannesson, Marel Scales, Seattle WA, pers. comm.). Limitations to using hopper scales on an open deck, in descending order of concern, consist of:

- wind causes instability in the motion-compensated scales if located on open decks;
- big waves crashing on the scale could damage the load cell;
- exposure to spray and waves will increase stress on components even though the system is waterproof.

Calibration of a motion-compensating scale is only as good as the test weights used for calibration. The regulations require use of certified weights for calibrating flow scales. At present, observers must confirm the calibration of flow scales. However, available technology could substitute for the observer during calibration. Attaching a readable ID, such as a Radio Frequency Identification (RFID) chip or a bar code, on each calibration weight could ensure that the correct weights are used for calibration. A reader on the scale (which the M2200 hopper scale control unit has) could identify and log the weights used for each calibration. A camera could be used to monitor the calibration process to check whether it is completed correctly.

Discards are currently estimated for catcher processors as the total weight measured with flow scales minus the retained weight calculated with product recovery rates. Theoretically, trawl catcher processors and longline or pot catcher processors could use flow scales and hopper scales, respectively, to measure discards. Direct measurement of the discards would likely provide an improvement in accuracy. A conveyor into which flow or hopper scales could be incorporated would take discards to a chute for dumping. However, most boats have limited space, and that space is often fully utilized. Requiring additional scales to measure discards could cause financial and logistical difficulties for vessel operators.

Hopper scales are problematic for longline and pot catcher vessels, which are generally smaller than catcher-processor vessels. If the vessels do not have a protected area comparable to a factory, then the hopper scale would not work. The hopper scales require a conveyor belt for transport of fish to the hopper and from the hopper to the processing area. If a vessel does not have room for the conveyors and the hopper scale in the protected area, then a hopper scale would not work.

2.3 Codend volumetrics

Volumetric estimates of the weight of catch in trawl codends using video cameras may be technically possible (Howard McElderry, Archipelago Marine Research, Victoria Canada, pers. comm.). To our knowledge, no effort to develop this technology has yet occurred. Several cameras placed strategically to measure length, diameter, shape, and possibly other parameters could be used to calculate the volume of the net. Accuracy would improve for vessels/fisheries that have the most consistently shaped nets; therefore, camera-based volumetric measurement is likely to be most suitable for larger vessels – catcher processors and larger catcher boats. Some of these vessels currently have total weight measured by flow scales, which provide a far superior value. However, vessels without flow scales, or without observers, may be suitable candidates for camera-based codend weight estimation. If smaller boats have widely varying catches that cause irregular shape of the codend, then accuracy will likely be a problem. Camera-based codend weight estimates may provide a supplement to the self reporting of total catch weight that is currently required in groundfish logbooks. They may also provide a technological cross-check of weights recorded in logbooks, as discussed in Section 2.4.

2.4 Fisherman participation in catch and biological data collection

Use of observer data alone or observer data supplemented by electronic monitoring will not be sufficient for obtaining all the information needed by the Council and NOAA Fisheries for management of bycatch or discards in groundfish fisheries in Federal waters of Alaska. Many vessels in the Alaskan fisheries are too small to carry observers, and the cost of observers may represent a substantial portion of revenues from these vessels. Cooperative research efforts among fisheries scientists and the commercial fishing industry are receiving increased attention as a method of supplementing or replacing standard research and data collection operations and reducing the costs of obtaining fishery information (Harms and Sylvia 2000). However, for this approach to work, fishermen need to be convinced that the effort is scientifically and

economically worthwhile; otherwise, they could view the research as threatening or not worth the effort, resulting in inadequate or ineffective participation. In a survey of US west coast groundfish industry and scientists, Harms and Sylvia (2000) found that industry participants favor those projects that allow them direct, and often independent, involvement and input into the scientific process, but that many scientists express concerns over bias and lack of objectivity with independent fisherman participation.

The National Marine Fisheries Service (NOAA Fisheries) Alaska Fisheries Science Center (AFSC) has a long and successful history of conducting research in cooperation with the fishing industry (Karp et al. 2000). For example, NOAA Fisheries charters commercial vessels for conducting stock assessment surveys. NOAA Fisheries has also had participating scientists on-board commercial vessels during experiments to 1) test effectiveness of a device to exclude Pacific halibut (a prohibited species) from trawl catch; 2) test different sampling methods for obtaining species composition; and 3) test flow scales for use on catcher processors. NOAA Fisheries and the fishing industry had broadly overlapping interests in reducing bycatch, better understanding the constraints to accurate catch accounting, and implementing improvements in catch accounting systems. While the fishing industry had a major role in proposing and developing the experiments, and had substantial self interest in successful completion of these experiments, NOAA Fisheries played a sufficient role to assure that the experiments complied with its scientific standards.

Expansion of the cooperative research model from joint research projects to independent fishery data collection following a prescribed NOAA Fisheries protocol, if successful, may enhance the likelihood of obtaining bycatch and discard data necessary for IFQ or co-op programs for the groundfish fishery. However, without assurance that fishermen would collect data without bias, management agencies may not want to use the data. Much self-reported data, such as for bycatch in groundfish fisheries, are not currently used for management purposes. However, the International Pacific Halibut Commission (IPHC) provides examples of using self reporting of bycatch and discards for analytic or management purposes. The IPHC interviewed halibut fishermen on

- bycatch of rockfish in Southeast Alaska, and reported the results to the Alaska Department of Fish and Game (Heather Gilroy, IPHC, Seattle WA, pers. comm.), and
- bycatch of seabirds, and reported results (and options for monitoring seabird bycatch) to NOAA Fisheries (Gilroy et al. 2000).

A pilot program to train fishermen to collect catch, discard, and location data for a small-boat tuna fishery in American Samoa is underway, under sponsorship of the University of Hawaii, Pelagic Fishery Research Program (John Kaneko, Pacific Management Resources, Inc., Honolulu HI, pers. comm.). Safety and space concerns preclude placement of at-sea observers, and no options other than self reporting were available for obtaining the data. The pilot program will qualitatively assess if the data are representative of the fishery in general.

Many government jurisdictions permit members of the public or members of a company or corporation to certify weights or measures. For example, the National Conference of Weights and Measures (NCWM) sets standards for public and corporate weighmasters (http://ts.nist.gov/ts/htdocs/230/235/h130-03/05_III_WeighmastLaw.pdf,

http://www.ncwm.net/main.html). Nineteen states have weighmaster laws based on NCWM standards, 13 have weighmaster laws not based on NCWM, and 21 (including Alaska) do not have a weighmaster law (http://ts.nist.gov/ts/htdocs/230/235/stlaw.pdf).21). Weighmaster models occur in Canadian fisheries on the Atlantic and Pacific coasts. The North Pacific Fishery Management Council has explored the use of weighmasters for monitoring landings of the Pacific halibut and sablefish IFQ fisheries in Alaska (Trumble et al. 1997), but did not develop management measures for weighmasters.

Penalties and bond requirements decrease the likelihood of weighmasters falsifying records. However, weighmaster programs typically work best if enforcement agents can directly monitor weights or measures. For example, agents can confirm the weight of cargo on a selected truck by weighing the loaded truck, weighing again after unloading (assuming that unauthorized offloads did not occur), and comparing cargo weight with the weighmaster report. Similarly, agents could monitor (undercover) weights of fish in totes in a fish plant to confirm that the weight of fish from a vessel corresponds to a weighmaster's report. While data collection at sea by fishermen would not be limited to weighing, the same concept may apply. Using weighmasters to report weights at sea, such as of discards, is problematic because direct monitoring by an agent is virtually impossible. However, remote monitoring through video cameras may provide an adequate check on activities of vessel personnel to assure accurate data collection for some types of data.

In the North Pacific many vessels are too small or otherwise unsuitable for at-sea observers. Currently vessels less than 60 ft long do not carry observers and those between 60ft and 125ft carry observers for 30% of their fishing days. EM is an option to monitor these vessels when observers are not available, or not an option. However, this technology cannot currently collect biological data. The remaining options are to either expand observer coverage, or use vessel crew to obtain information about bycatch and discards. Some of the data may be useful for programs other than bycatch or discard monitoring, or may be suitable for collection by remote monitoring. However, data collection by vessel personnel in these cases may still be effective, because using technology to check on data collection by fishermen is less expensive than collecting data directly through electronic monitoring (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). The following steps could determine the feasibility of data collection by vessel personnel with remote monitoring of data collection activities:

- NOAA Fisheries determines minimum data necessary for bycatch/discards
- NOAA Fisheries determines minimum activity from vessel personnel to obtain it
- NOAA Fisheries determines what training necessary for vessel crew
- Is it feasible for crew to perform minimum duties to collect data?
- Can camera monitoring or gear sensors detect violations of crew data collection duties?
- If yes, then weighmaster/self monitoring concept is worth further evaluation for data collection.

The self-reporting with electronic monitoring concept will not work if the fishermen do not consider it an advantage over the existing system and if they do not accept a responsibility for assuring data quality. The vessel crews will have to do more work than under the existing system, and the electronic monitoring will impose a cost on the vessels. The vessel operators and crews may not want management agencies to know the amount of bycatch. The incentives to

misreport may be higher than the perceived benefits of accurate data. However, a change from open access to groundfish IFQ or co-op management may depend on agencies obtaining the necessary data. Vessel operators may determine that a requirement for bonded and trained weighmasters on vessels may have benefits that exceed the costs – for example, if reduced costs or increased revenues under IFQ/co-op management exceed the cost of the weighmaster, or if fishermen were willing to pay more to end open access.

Following the success of the halibut and sablefish IFQ program and the Alaska pollock AFA co-op program, many groundfish vessels operators recognize a benefit in, and support, moving toward an IFQ/co-op program. This offers an opportunity to delegate development of many details for a self-reporting bycatch data collection system to the fishermen: if they want the IFQ/co-op program, and the program is contingent on bycatch data collection, the fishermen have an incentive to develop a system that meets the standards of the Council and NOAA Fisheries.

Under this scenario, agency staff would meet with fishermen to discuss standards for bycatch data, available technologies to monitor data collection activities, and costs and benefits of vessel by vessel monitoring. Industry representatives would determine how to formulate data collection by vessel personnel combined with electronic monitoring such that fishermen would best meet the data standards. If the data collection does not follow proper protocols, then the weighmasters and vessels would be subject to penalties. Discussion points for developing standards and selecting data collection/monitoring components could include the following:

- Fishery information – check haul-by haul information with auto-logged info (GPS location, fishery sensors) to assure proper sequence of sampling hauls.
- Discarded catch– video cameras could monitor species composition for longline and possibly pot vessels; no direct methodology for estimating weight of discards.
- Biological data – weighmaster to collect bycatch samples, do species identification, and measure lengths using electronic measuring board. Check with camera to record sample collection, species identification, and length measurements techniques used on board.
- Reduce presorting or non-random samples by monitoring with camera
- Bird/mammal bycatch – monitor with camera; requires crew assistance
- Use of bycatch reduction devices – check with camera

Many fishery managers express reluctance to use self-reported data from fishermen for analyses and management decisions. Self-reported data have a direct impact on fishermen's self interest, which provides an incentive for misreporting. If fishermen can reduce the reported catch or bycatch, then seasons remain open longer, but often at the expense of exceeding quotas. The continuing issue of presorting groundfish catch before observers can sample the catch is a prime example of this problem. Using technology to monitor self reporting may not receive support from fishery managers without assurances that the program provides accurate and unbiased data.

Highly competitive fisheries, such as open access, will likely provide an environment in which fishermen will find an incentive to misreport. However, as fisheries move to more rights-based management, such as IFQs or co-ops, or co-management that actively involves fishermen in decision making, data gathering, and data sharing, fishermen may have more incentives to correctly report data they collect. Fishermen engaged in and with responsibilities for the

management system will, more likely than competitive fishermen, see the advantages of accurate data. Under user pay systems, fishermen participation in data collection could reduce costs compared to at-sea observers. Monitoring the reports with electronic means provides some confirmation that fishermen participation occurs in generally appropriate ways. No measures are likely to guarantee accuracy of all fisherman data reports, but non-competitive and engaged fishermen with financial responsibility for data collection have reasons to support accurate data, especially if monitored with electronic means.

2.5 Improved technology for observers

2.5.1 North Pacific Groundfish Observer Program equipment

With the exception of CDQ and AFA fisheries, equipment used currently in the NPGOP has not changed substantially since the beginning of the observer program in the 1970s. Observers typically weigh fish in baskets using 2 and 12 kg brass and 50 kg Salter spring scales or simple Chatillon platform scales, and collect data by writing or tallying on plastic sheets (Martin Loefflad, AFSC, Seattle WA, pers. comm.). Observers may transfer data from plastic sheets to paper forms for a permanent record or may use one-time plastic sheets for a permanent record, and subsequently enter data into an electronic transfer system. Vessels that fish for CDQ or for AFA pollock, except catcher vessels that deliver unsorted catches, must supply motion compensated scales and work stations that meet NOAA Fisheries specifications. The NPGOP is aware that other technologies, such as electronic measuring boards and hand-held computers, could improve observer sampling, but has not incorporated them because of a need to evaluate the increased costs against the benefits to the observers and to the program.

2.5.2 Alternate observer equipment

Electronic data-logging

Observers in the Alaska Region currently write data on plastic sheets for transcribing to paper and subsequently entering on a computer for transmission. The multiple steps in this data-logging procedure require considerable time, and risk transcription errors at each step. Hand-held and tablet computers offer an opportunity for immediate data entry by observers and other field party staff. Outliers, or data that fall outside of normal limits, may be discarded because confirmation cannot occur after the fact, but may represent true values. Several electronic data-logging systems for use by observers may potentially reduce the potential errors resulting from the status quo. We could find no organizations that provide electronic measuring and data-logging systems for observers, although the British Centre for Environment Fisheries and Aquaculture Science (CEFAS) uses electronic measuring boards for port sampling (http://www.cefas.co.uk/news/Insight-May02.pdf).

The NEFSC is experimenting with a WalkAbout Hammerhead XRT tablet PC (http://www.walkabout-comp.com/products_specs_xrt.html) for use by observers to enter data as

collected at sea (David Potter, NEFSC, pers. comm.). The tablet PC is programmed to display data entry fields that mirror the current paper forms observers use to record data. The Hammerhead has digital recognition of hand writing, so observers can fill out the forms with a stylus. The program performs an error checking to confirm all data fall within set bounds, and warns if fields are left blank. The Hammerhead is splash resistant, but not water proof, so is best suited for larger vessels with some protection from the elements. The National Observer Program tested the Juniper Systems hand-held computer, the Allegro (http://www.junipersys.com/products/products.cfm?id=9) and the Itronix tablet (http://www.itronix.com/products/tablet/gobooktablet.asp) in December 2003 aboard a fishing vessel in the Bering Sea (Teresa Turk, NOAA Fisheries Observer Program, Washington D.C., pers. comm.). As a result of the tests, NOAA Fisheries made some suggestions for improvements to the equipment. Additional tests are scheduled for early in 2004. The ruggedized tablet, handheld, notebook computers cost in the three to four thousand dollar range.

Electronic measuring boards with internal data-logging or with connections to hand-held or tablet personal computers (PS) can quickly and accurately measure fish. The data loggers typically contain error checking programs that will signal for re-measurement for lengths or weights that fall outside of a prescribed range, which eliminates outliers. The program may signal blank fields, and not allow closing out data for a set or haul until all fields are complete. A test of an electronic measuring board and a standard measuring board to obtain lengths of Atlantic herring showed that accuracy increased and time per fish decreased when using the electronic measuring board (Bourque and Cairns 1994). The electronic measuring board was linked to a computer with a real-time plausibility test that alerted the operator when outliers occurred. Real-time conformation or correction of data occurred. Automatic data entry eliminated data entry and data verification time and errors. Several research groups use electronic measuring boards on fishery survey, including NOAA Fisheries, CEFAS, and the Australia Fishery Management Authority. Electronic measuring boards cost on the order of three thousand dollars each.

Two concepts currently link electronic measuring boards with electronic data logging. Limnoterra (http://www.limnoterragroup.com/fmb/fmbhp.html) manufactures an electronic fish measuring board that performs as a data logging device, with 167 functions for user defined fields. Associated data, such as date, location, loran C start, loran C end, time start, time end, basket weight, species codes, sex, specimen weight, number of specimens, and tag number, can be logged onto the board with the length and species. The Limnoterra board currently requires a cable connection to computers for downloading data, although a prototype wireless model is in preparation (Jon Planck, Limnoterra, pers. comm.). Scantrol (http://www.scantrol.net/FishMeter.htm) also makes an electronic measuring board with internal memory that transfers data to a computer with a cable. The Scantrol board also links with electronic scales to store weights. Lat.37 manufactures a wireless fish measuring board that links to a hand-held computer (http://www.junipersys.com/files/wireless_fish_measuring_board.pdf), rather than storing data in the measuring board. The Lat.37 measuring board uses the Juniper Systems Allegro hand-held computer to store length, species, and associated data. The National Observer Program tested the Lat.37 wireless measuring board in the Bering Sea aboard a fishing vessel (Teresa Turk, NOAA Fisheries Observer Program, Washington, D.C., pers. comm.). As a

result of the tests, NOAA Fisheries made some suggestions for improvements to the equipment. Additional tests are scheduled for early in 2004.

Numerous hand-held GPS units suitable for marine use are available with which an observer could independently obtain location of sets or hauls. GPS units from companies such as Garmin and Magellan allow track point storage for multiple tracks and come with computer cables to download positions to a computer. These hand-held GPS units can cost in the $250-400 range, but may range up to three thousand dollars for professional models. The Limnoterra electronic measuring board, the Allegro hand-held computer, and the Hammerhead tablet will download data from GPS.

Fishery Scientific Computing System

NOAA's Office of Marine and Aviation Operations developed a computer system, the Fishery Scientific Computing System (FSCS), to digitally collect all critical fisheries-independent data aboard research vessels (Teresa Turk, NOAA Fisheries, Washington, D.C., pers. comm.). Improvements to the system have been made by the Northeast Fishery Science Center and the Northwest Fishery Science Center (NWFSC). Four Regions currently use FSCS for research and charter vessels, and other regions are considering the system. The system uses wireless connections between various sampling devices to send data to a computer for data logging (Figure 2). The NWFSC developed a TowLogger system to automate the collection of sensor data; TowLogger collects and sends position and time data for various trawl events from GPS receivers, net mensuration and position data from Simrad's Integrated Trawl Instrumentation (ITI) equipment, and weather and sea state conditions. The NWFSC also developed an Integrator that displays temporal output data produced by FSCS, TowLogger, or other sensors.

The FSCS is currently configured for trawl data, but NOAA Fisheries is working to expand the capability to other gear types. NOAA Fisheries is also exploring the suitability of FSCS for assisting at-sea observers collect and log data.

Sampling

Considerable practical difficulties arise with obtaining a true random sample on the deck of a trawl catcher vessel. These include difficulties with access, in physically moving around on a trawl deck covered in fish, and choosing where and how to take a random sample of the catch. In mixed fisheries, the different sizes and shapes of various species may lead to vertical stratification and fore-aft presorting. Large pollock catches streaming into the hold have similar problems but with the additional problem of observer safety when trying to obtain samples. MRAG Americas (2003) recommended tests to evaluate a specially designed brailer or corer system to subsample mixed catch from the deck. Installation of a mechanical arm holding a sampling basket that could be inserted into the flow of fish at randomly determined intervals could provide safe, but possibly expensive and disruptive, sampling from large pollock catches.

Observers on factory trawlers gather samples from a moving belt by diverting fish from the belt. Development of an arm that automatically shunts fish from the belt for sampling could reduce the amount of work required of observers.

Scales

The mechanical scales used by non-CDQ or AFA observers have limited accuracy caused by vessel movement, and do not allow downloading of weights to a computer. However, the scales are robust and withstand the rigors of sea conditions in the North Pacific if properly maintained. Other mechanical scales will offer little improvements over the current scales.

The selection of electronic scales as alternatives is limited. Motion-compensated platform scales by Marel, Pols, and Scanvaegt are already certified for use as observer sampling station scales. The scales store data and can download to a computer. The scales are designed for marine application, but their suitability for use in the more extreme conditions of an open deck is not clear. Motion-compensated scales may have accuracy and reliability problems when buffeted by wind and waves (Section 2.2). These scales cost on the order of five thousand dollars each, a high cost for the number required by the observer program.

Salter Brecknell (www.salterbrecknell.com) makes the ElectroSampson electronic hanging scale with a maximum capacity of 45 kg, 5 kg less than the Salter spring scales. The ElectroSampson has a digital readout, but no capability to link to a computer. The ElectroSampson is not sealed or waterproof, which would put the scale at jeopardy when operated in the wet conditions often experienced on open decks. The scale has a minimum operating temperature of 0°C, which makes the scale suitable for observer use only during part of the year when cold weather does not occur. The ElectroSampson costs approximately $125.

3 Monitoring fishing activities

3.1 Vessel monitoring systems

A Vessel Monitoring System (VMS) enables the location of fishing vessels to be monitored remotely by external regulators, either in real time or retrospectively (MRAG 2003). Since its introduction in the 1980s, VMS has been used as an operational tool to enhance the efficiency of standard monitoring, control and surveillance (MCS) activities. A VMS complements existing MCS programs, significantly enhancing the coastal state's resources for regulating fishing activities within its EEZ and other boundaries. By providing automated monitoring of vessels locations and activities, VMS provides cost effective and efficient support for rapid identification of potential infringements, which can then be targeted for further investigation. The position reports sent from the vessels, in quasi-real-time, give the fisheries managers a view of the current status and historical patterns of vessel activity. The term VMS has become synonymous with a satellite vessel monitoring system with a number of different satellite networks providing the position fixing and the communications functionality for the vessels. However, a VMS can obtain vessel position reports from a variety of sources including VHF radio transponders, via mobile phone short message service (SMS) messaging or at the simplest level by voice reporting. The feature of automated reporting of vessel location sets VMS apart from more traditional systems. In some systems, the management agency can poll vessels by remote control.

3.1.1 Positioning

Position fixing in a VMS can be achieved through an interface with any existing positioning system with the required accuracy. Satellite systems with this capability presently include the NAVSTAR Global Positioning System (GPS) operated by the Interagency GPS Executive Board (IGEB), the Russian GLONASS (GLObal NAvigation Satellite System) and the US Argos doppler based system (ArgoNet) operated by NOAA. Land based systems such as RADAR used in conjunction with a tagged vessel system (to uniquely identify the vessel) could also be used (MRAG 2003). In the future the European GPS project (Galileo) may provide an alternative option for geographical position determination, although at present there is some uncertainty about the future of this project.

Although there are a number of potential position fixing solutions for a VMS, the only two really potentially viable services available at present are the NAVSTAR GPS System and the Russian GLONASS. Both of these use networks of about 24 orbiting satellites in a variant of different planes. Each of the satellites transmits radio frequency timing and navigations signal. The vast majority of current VMS applications are based on the US standard positioning service.

Generally a transponder unit located on the vessel uses either an external positional data feed, or an integrated internal unit to record positional data, with associated date and time of the reading for subsequent transmission to a fishery monitoring center (FMC). The vessel's existing GPS navigational systems may provide the external feed or the transponder may have an integrated GPS receiver and antenna (internal or external). In theory, future VMS applications could use an alternative positioning system, such as a land or space based RADAR system, which forwards the vessels detected position to the on-board vessel transceiver unit (or direct to the FMC should the legislation permit).

The NAVSTAR GPS is, in the first instance, a military navigation system designed, financed, deployed and controlled by the U.S. Department of Defense. However, although the primary goal of GPS is to provide land, air and marine positioning capabilities to the U.S. armed forces and its allies, GPS is freely available to all users. It now provides an improved guarantee of 36m horizontal accuracy at a confidence level of 95% when all satellites in view (IGEB, 2001). Allowance must be made for loss of satellites, although the standard dictates this level of service for 90% of the time in any 24 hour period in the worst case location (99% average location). In effect, it is our understanding that a perfect antenna and GPS receiver would expect to receive information from the Satellite constellation that was accurate to 36m at a confidence level of 95% anywhere on the earth, for 90% of the time in any 24 hour period (MRAG 2003).

Practical issues of cost and transmission speed introduce a source of error in VMS position reports (MRAG 2003). Data transmitted from the transceiver units across the satellite network to the FMC are encoded in binary data packets. In this respect, binary data has a finite precision unlike a continuously variable analogue signal. In its current form, for example, the Inmarsat data packet assigns only enough data units to allow position to be recorded to the nearest 0.04 of a minute, which equates to about 75m at the equator. Similarly the ArgoNet system resolves positions to only 1000^{th} of a degree (~ 55 m). The resolution of reporting provided for by the EutelSat network is not yet known.

3.1.2 Communications

The general pattern of operation is similar for the several different satellite communication networks (e.g. Argos, Inmarsat and EutelSat) (MRAG 2003). A transponder on a vessel obtains its position from a GPS satellite, either directly or through the vessel's own GPS unit, and then relays this information along with an identifying code and the current date and time via a satellite communications network to a land earth station (LES). The LES then forwards this position report to the VMS, either via a direct connection or as a secure email/telex. The position report is then read into a database and displayed on a screen for a user to see. A typical VMS is shown in Error! Reference source not found. for a VMS system operating on an orbiting satellite network (a Geo Stationary satellite would however transmit directly to an LES and not between satellites as displayed). The main difference between satellite communication networks arises because of the orbital characteristics of the satellite.

Geostationary satellites (e.g. EutelSat and Inmarsat) are continuously available and have a permanent footprint within which data can be transmitted almost in real time (MRAG 2003). When a vessel moves outside the footprint area of coverage a message can be transmitted only if it is within the footprint of another satellite. Outside of the footprint of geostationary networks a vessels position cannot be monitored until it returns to a position within the footprint. The Inmarsat network covers almost the entire globe, the only exceptions being near the two poles. By contrast, orbiting satellites such as those that make up the Argos network operate in a store and forward fashion. As the satellite orbits and a vessel come into 'view' the messages are sent from the vessel to the satellite. The messages are stored into the satellite until it a ground station comes into view (typically after about 20 minutes) when the stored data are forwarded back to earth.

NOAA Fisheries has approved the following VMS service providers for US fisheries in the EEZ (http://www.nwr.noaa.gov/1sustfsh/groundfish/VMS/VMS_Type_approval_notice.pdf):

Telenor Satellite Services - http://www.telenor-usa.com
Xantic - http://www.xantic.net/ or http://www.landseasystems.com
Orbcomm – http://www.orbcomm.com
Satamatics - http://www.satamatics.com

3.1.3 Uses and limitations of VMS

The value of a VMS as a monitoring tool, to provide near-real-time information on the position and activities of vessels in the fishing fleet, is clear. The detailed effort data provided by VMS have many valuable applications in fisheries management; for example, in the evaluation of the effects of fishing on sensitive habitats. However, a major part of the value of this tool in the enforcement of fisheries regulations depends upon the extent to which the data it provides can be used as evidence in legal proceedings against vessels that are thought to have fished in an area or

at a time when they should not have. The types of fisheries offense in which VMS data has been accepted as evidence before a court can be categorized as follows:

Type of offense	Value of VMS in providing evidence
Unlawful entry into a closed area	For vessels carrying the necessary equipment, VMS is the most efficient MCS tool for monitoring entry and exit into fishing zones, and controlled zones as it is operational over the whole set of zones and for 24 hours a day. However, it provides no information on the location of vessels that are not part of the system.
Failure to properly maintain a logbook	The systematic comparison of VMS data with logbook data may detect inconsistencies in the latter. The process of comparison could be greatly simplified by the introduction of electronic logbooks
Provision of false information to the relevant fisheries administration	VMS data can be cross-checked with logbook and other data reports on catch and fishing effort (e.g. days at sea)
Tampering or interfering with the transponder	These offenses are inextricably linked to the existence of the VMS
Failure to properly maintain a functioning VMS transponder	

The VMS position reports of a vessel might well suggest that at a given time it was engaged in fishing activities in a closed area or during a closed period. However, a large number of offenses (such as prohibited gear or catching undersized fish) remain that VMS cannot identify. NOAA has successfully prosecuted a scallop fishing vessel in New England for entering a totally closed area, using only VMS data as evidence (MRAG 2003). However, to date, VMS data have not been sufficient to prove evidence of illegal *fishing* in a closed area or in a closed period in US court proceedings. The need remains, therefore, for traditional methods of surveillance, including units on land, at sea and in the air, with VMS data currently providing a supporting role.

NOAA Fisheries regulations for VMS covering fishing vessels in Alaskan waters currently require only position data on a regular schedule. This requires only a one-way communication, from the vessel to the control center. Adding two-way communication greatly expands the capability of VMS systems for a variety of additional functions. A fully functional VMS component can interface with satellite systems to provide Email, Fax, pager, telephone, SMS, Internet, X.25 data packet routing (http://www.webopedia.com/TERM/X/X_25.html), and X.400 (http://www.webopedia.com/TERM/X/X_400.html) messaging protocol. The VMS component can have full vessel and system alarms, event alarms, and full chart backgrounds. A two-way communication takes advantage of the additional capabilities for such enhancements as transmitting catch and other data from vessels, polling vessels for location at unscheduled times, search and rescue and other safety issues, fishery management issues, and business and personal communications.

Catch data. Catch, effort, and other fishery data required to be reported from vessels that are logged in an electron form, such as electronic logbooks (Section 3.4), can be transmitted from vessels to shore stations. Transmitting electronic logbook data via VMS provides for availability of real-time (or near real-time) data, fine scale spatial data, position data reported independent of the operator, and catch and effort data declared prior to boarding/inspection. Properly formatted electronic logbook data can load onto catch monitoring and management data systems without transcription errors. The Alaska Region currently requires or supports electronic catch reporting (SPELR (www.fakr.noaa.gov/er/)), but not through a system tied to VMS. Data other than catch and effort, such as video

Polling VMS with one-way communication usually reports on a set schedule. However, two-way communication allows remotely controlling the reporting schedule (FAO 1998). This is a valuable tool in fisheries management as it permits the VMS operator to vary the frequency of position information as a function of the behavior and whereabouts of a vessel. While in port, for example, the position of a vessel is useful only to confirm that it is still in port. This can be accomplished with a single, daily report. During operation in fishing grounds or, particularly, near sensitive areas, the VMS operator may require much higher frequency data. Security requirements for polling are high, to prevent unauthorized access.

Safety The Inmarsat-C system is a component of the Global Maritime Distress and Safety System (GMDSS) when configured according to rules of the International Maritime Organization (IMO) to meet Safety of Life at Sea (SOLAS) specifications (USCG 2003). Inmarsat-C is a data-only system that supports text messaging and compressed data reports. Position reports are derived from a connected or integral navigation receiver. SOLAS configurations include a distress button for emergency use, priority handling of distress and safety messages, audible alarms on the vessel, and an Enhanced Group Calling (EGC) feature enabling reception of the SafetyNET Marine Information Broadcasts. The Coast Guard has expressed concern that NOAA Fisheries VMS regulations have accepted non-GMDSS satellite systems with non-standard or one-way messaging capabilities and versions of Inmarsat-C in which a messaging unit is optional. The Inmarsat-C transceiver can provide the position reporting function either automatically or when polled but without a laptop or other messaging facility, the unit cannot send or receive messages. NMFS has made it clear that while they recognize the safety benefit of a two-way communications capability, their mandate has been limited to Law Enforcement requirements.

Fishery management One-way communication does not allow for messages to be sent to vessels from management agencies. With two-way capability, management agencies can send messages to vessels, which may prove very useful for special notifications of openings, closings, warnings of encroachments near or into restricted areas, etc. Also, vessels can provide notice or declarations when transiting the restricted area, changing from one fishery to another, and transmitting catch data in real or near-real time. An enforcement working group of the Pacific Fishery Management Council (PFMC) considered various requirements for VMS, and determined that the INMARSAT-C system flexibility to add a message terminal or a PC best met enforcement and management needs (PFMC 2002).

Business and personal communications The email, fax, pager, telephone, internet, and messaging features potentially available through VMS could enhance communications from vessel crew members with owners, family, parts and supplies services, shipyards, and others. Internet access could allow for upload of vessel data to secure website for controlled access by designated business partners of daily logs, cost allocations, safety reports, vessel positions, and other information. The fishing community has expressed significant interest in for low-cost, satellite voice communications (FAO 1998) that could become available through VMS. However, there is a concern whether the system is capable of transmitting a position report and responding to a poll, while the crew aboard a vessel is talking on the telephone. If not, telephony may be incompatible with VMS architecture.

3.1.4 Current VMS requirements for US fishing vessels

3.1.4.1 US domestic fisheries

Alaska Enforcement Division - The Alaska Enforcement Division monitors all vessels in the Atka mackerel and Cod/Pollock fisheries using VMS (http://www.nmfs.noaa.gov/ole/vms.html). Vessels provide position reports to the division seven days a week, 52 weeks per year. It is unlawful for any person to operate a vessel in any Federal reporting area when a vessel is authorized to participate in the Atka mackerel, Pacific cod or pollock directed fisheries and the vessel's authorized species and gear type is open to directed fishing, unless the vessel carries an operable NOAA Fisheries-approved VMS and complies with Federal VMS requirements (679.7(a)(18)). All vessels using pot, hook-and-line or trawl gear in the directed fisheries for pollock, Pacific cod or Atka mackerel are now required to be registered for these species. The VMS must be operable when any of these three fisheries (Atka mackerel, pollock or Pacific cod) for which the vessel is endorsed is open, regardless of the target species. If the unit malfunctions, the NOAA Fisheries Enforcement Division will determine the appropriate action on a case-by-case basis. This requirement is necessary to monitor fishing restrictions in Steller sea lion protection and forage areas (http://www.nmfs.noaa.gov/ole/Alaska/vmsfaq.html). In addition, the 2003 IPHC regulations (section 15) allow halibut fishing vessels using a transmitting VMS to obtain a waiver from clearance requirements in IPHC Area 4. The NOAA regulations require only that the VMS units are approved by NOAA Fisheries, and that the units transmit during fishing operations.

Northeast Enforcement Division - Northeast VMS regulations became mandatory in 1998 for approximately 275 limited access scallop permit holders (http://www.nmfs.noaa.gov/ole/vms.html). All vessels are required to provide at least hourly position reports, seven days per week, 52 weeks per year, primarily to monitor annual allocations of days at sea for each vessel. The VMS counts the number of days at sea, and assists in assuring that annual allocations are not exceeded. A secondary purpose of the VMS is to help determine vessel compliance with closed areas. The VMS will also provide the same services and benefits for the Northeast multispecies industry as those currently in place for the scallop industry. Participation is voluntary, however, for the Multispecies vessels. Multispecies vessels that do not use the VMS to count days at sea are subject to a call-in system.

Southwest Enforcement Division - NOAA OLE Pacific Islands Division pioneered the use of VMS in US domestic fisheries. A VMS has been operational in the Hawaii pelagic longline fishery since 1994 (http://www.nmfs.noaa.gov/ole/vms.html). Approximately 150 longline vessels are prohibited from fishing in large areas that were established to reduce localized overfishing, and to minimize conflicts with endangered species. The VMS monitors compliance with the closed areas. Since 1998, Pacific Islands Division has used the VMS to monitor, on a volunteer basis, lobster fishing vessels that operate in the Northwestern Hawaiian Islands. These vessels also use the VMS to transmit daily catch and effort information to NOAA for use in quota management. The Pacific Islands Division has also monitored the activity of 25 foreign fishing vessels. VMS installations on these foreign vessels were ordered by the US District Courts (of Hawaii and Guam) as penalty conditions for violating US fishery laws. Pacific Islands Enforcement has also studied the application of VMS in small boat fisheries, conducting a demonstration project with several "alia" fishing vessels in American Samoa. The project showed that small vessels operating in remote areas can be monitored effectively via battery powered VMS units.

Southeast Enforcement Division - The Southeast Enforcement Division is in the process of implementing the VMS requirement for the Highly Migratory Species Fishery - Atlantic and Gulf Coast (http://www.nmfs.noaa.gov/ole/vms.html). This operation will initially consist of 320 VMS equipped vessels. Additionally, Southeast Enforcement Division is preparing to launch the South Atlantic Rock Shrimp operation that will initially consist of 170 VMS equipped vessels. These programs are scheduled to begin in September and October 2003, respectively. This program will increase revenues for swordfish and shrimp fishermen while reducing enforcement costs.

3.1.4.2 Foreign and high seas fishing

International Convention for the Conservation of Atlantic Tunas (ICCAT) - ICCAT requires each member country with vessels greater than 24 meters that fish on the high seas outside the fisheries jurisdiction (Exclusive Economic Zone (EEZ)) of that country, to adopt a pilot VMS program (http://www.nmfs.noaa.gov/ole/vms.html). The 3-year ICCAT-recommended VMS pilot program was implemented October 1, 2000. Up to 300 U.S. swordfish vessels are required to carry VMS and will be monitored by the NOAA Fisheries Office for Law Enforcement.

Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) – Krill vessels may voluntarily carry a VMS unit (http://www.nmfs.noaa.gov/ole/vms.html). Vessels in all other CCAMLR fisheries are required to carry VMS as a condition of their harvesting permits. The Southwest Enforcement Division in Hawaii has been tracking one voluntary US krill vessel fishing in the convention area for the past year. The owner of the vessel also receives the vessels' position reports from NOAA Fisheries as a courtesy.

3.2 Hydraulic or engine monitoring

Remote monitoring of fishing vessel activity using directly transmitted data could assist the owners and operators of fishing vessels and companies. Monitoring equipment exists and is readily available for many key vessel activities associated with fishing operations. AMR currently uses hydraulic sensors for monitoring changes in hydraulic pressure to indicate use of fishing gear. Both AMR and Digital Observers use winch/drum counters to monitor specific equipment. Although not currently used for monitoring fishing activities, digital pyrometers are available for measuring exhaust gas temperature as an indicator of fishing activities. While many vessels operators may currently use a pyrometer to monitor exhaust temperature as an indicator of engine performance, models with an NMEA 0183 hookup would make the units suitable for electronic data logging.

More developed example applications of the necessary technology exist on land. For example, the trucking industry routinely uses sensors on engines and trailers, combined with GPS locators, to operate vehicles and manage fleets more efficiently and to meet government standards for driver working conditions. Schneider International, for example, owns 13,000 tractors (the cabs) and 42,100 trailers (the back part of the truck that carries the goods), making its fleet the largest in North America (http://www.darwinmag.com/read/090101/haul.html). Each cab is outfitted with OmniTracs, a satellite-based communications and positioning system from Qualcomm (http://www.qualcomm.com/qwbs/products/omnitracs/). A black box mounted inside all Schneider cabs has a keyboard and allows drivers to send and receive text messages to and from customer service associates. Qualcomm processes seven million data transactions every day. Schneider and Qualcomm also jointly developed a monitoring technology called SensorTracs (http://www.qualcomm.com/qwbs/products/sensortracs/), which uses electronic engine sensors to record information such as speed, rpms and idle time. SensorTracs interfaces directly with a vehicle's sensor inputs or the onboard data bus to provide RPM, speed, and idle summaries, so you can isolate vehicle operation in the driver's control. The information is delivered to dispatch at customer-defined intervals or on demand via Qualcomm's mobile communications systems. No driver intervention is necessary. The data are also displayed for drivers in real time, so they can modify driving habits immediately and meet company-set parameters. In 1990, Schneider became the first fleet to implement the technology, allowing the company to receive engine data via automatic satellite downloads. SensorTracs helps Schneider manage wear and tear on its engines and also monitors drivers. Not only can Schneider monitor the whereabouts of its trailers, a sensor unit inside the trailer can tell whether the trailer is empty or full. Another sensor mounted in the bottom of the trailer can tell whether it's hooked to a tractor.

3.3 Monitoring fishing activity using cameras

3.3.1 Canadian sablefish seamount fishery

Sablefish populations on seamounts located within between 100-200 miles offshore are generally thought to be separate from the inshore populations found along the continental slope. The Canadian Department of Fisheries has allowed a limited experimental fishery on seamount

stocks under strict monitoring requirements to ensure that permitted vessels do not fish coastal stocks and that only seamount-caught fish be retained on board until the offloading. These measures were put in place to ensure clear separation between the special permit seamount fishery and the lucrative coastal quota fishery. Electronic monitoring equipment is deployed by AMR for the duration of the one-month fishing permits to provide continuous recording of GPS, hydraulic and winch activity, and imagery of the fishing deck. The electronic monitoring systems have proven to be reliable and provide monitoring at 20% the cost of an at-sea observer.

3.3.2 Canadian Dungeness crab fishery

In 2000, the Canadian DFO initiated a pot-limit control program for a Dungeness crab fishery in a specific area ("Area A"). The Canadian Government needed to monitor the number of pots deployed and the crab industry wanted to control theft of catch and gear (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.). An at-sea observer program could have provided the monitoring necessary to meet the requirements of both the government and the industry, but the costs of a comprehensive observer program would have been prohibitive. Monitoring with patrol boat inspections was rejected because inspections could not control fishing activities when the patrol vessels were absent. AMR worked with the industry to develop an EM system that met both demands, at a reasonable cost.

The crab EM system consists of an on-board computing system, enclosed in a locked, tamper-proof housing, and an assortment of sensors on the fishing deck and other parts of the vessel (McElderry 2003). One of the main features of the system is a time-lapse closed circuit TV (CCTV) camera system that provides a continuous record of fishing deck activities. The mast-mounted camera provides imagery of various fishing operations including, gear setting, hauling operations, retention and discard of catch, and gear identity, as revealed by vessel specific buoy colors. Computer-based digital video technology far surpasses the capabilities of the VHS tape-based predecessor, allowing rapid search and viewing of specific imagery. Also, digital imagery can be authenticated to ensure origin and integrity of data.

The crab EM system also includes radio frequency identification (RFID) for crab pots, a camera to monitor deck activity, a GPS receiver, and a hydraulic pressure transducer for the pot hauler. A small RFID chip is imbedded in the buoy of each crab pot, and the buoy is passed near an RFID scanner to generate a time-date-location stamp when set and retrieved. The hydraulic sensor also determines when hauling and setting occur. A computer program checks each hauling event for an RFID scan, and the camera can document any fishing activity that occurs during an anomalous hauling event. The GPS receiver determines location of fishing activity. The fishery consists of about 34,000 pots and 0.5 million scans per year. The system tracks deployment of all individual pot sets at an annual cost of about CDN$10 per pot, or about 20% of the cost of at-sea observers. AMR has analyzed the RFID scans, looked for anomalies, and reviewed the camera images to determine if fishermen scanned all pots. By plotting station tracks through GIS and reviewing sensors on fishing gear, analysts could determine when pots should be scanned; if scan did to appear in the data, video monitoring could determine if pots were pulled without scanning. Diverting from a normal track line or spending long periods in a location would cause an analyst to review the video to determine if a fisherman pulled pots belonging to someone else and did not scan them.

The crab EM system satisfies the requirements of both the Canadian Government and the industry. However, in spite of the success of the program and the support of the Area A fishermen, only the Area A fishermen have adopted the EM program (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm.).

3.3.3 Work in development and application to other fisheries

3.3.3.1 Monitoring seabird avoidance devices

NOAA Fisheries contracted with IPHC to test EM on halibut vessels (Ames 2004; Ames *et al*. 2004) with a goal of monitoring 1) the use of seabird avoidance devices, and 2) the seabird bycatch. Video observers and at-sea observers had 100% agreement detecting bird avoidance devices for daytime sets.

Testing of ability to detect and identify seabirds caught on longline gear was tested by placing 63 previously caught and frozen seabirds on hooks during setting. Video observers correctly identified as birds 91% of the birds place on the longline sets, but correctly identified the birds to species in 64% of the cases. Higher-speed recording enhanced the ability of video observers to identify birds.

3.3.3.2 Longline hook counter

Digital Observers is working on a stand-alone hook-counting device for longline vessels (Mark Buckley, Digital Observers, Kodiak AK, pers. comm.). The intent is to be able to track every set during a fishing trip as a discreet event and to count every hook that goes over the stern during each set. The hook counter would indicate that fishing activity has started, and could link to camera monitoring or hydraulic sensors/revolution counters to provide information about fishing activity (e.g., soak time). Hook counts also provide a measure on effort. The prototype hook counter uses a laser beam aimed at a receiver deployed at the stern of the vessel. During setting of the longline, the gangion flies up, and breaks the laser beam. The laser is positioned to avoid counting snarls and tangles. A connection to a GPS provides date, time and location for the beginning and end of a set. A test of the prototype occurred during October 2003. The hook counter worked as expected for about half of the experimental trip, and then stopped working altogether. Digital Observers sent the prototype back to the manufacturer to determine the cause for the failure and to modify the design to improve robustness.

3.3.3.3 Presorting in the Pacific whiting fishery

The Pacific whiting fishery off Washington and Oregon was identified as needing at-sea monitoring because of concerns about accurate estimation of catch and bycatch. Short fishing trips of less than a day and departures frequently with little notice made the use of at-sea observers problematic. An experiment with EM by AMR aboard a US west coast whiting vessel

in 2002 demonstrated that wide angle camera images could ensure that all catch was retained aboard as required (http://www.archipelago.ca/em-projects-whiting.htm). Based on the pilot project conducted in 2002, electronic monitoring systems are being considered as a monitoring option for the shore-based whiting vessels to verify whether all catch is retained and/or identify the frequency of catch being discarded at sea. The West Coast Groundfish Observer Program will fund electronic monitoring systems being placed on all shore-based whiting vessels during 2004 to evaluate whether these systems can be useful tool to verify full retention of catch (Carrie Nordeen, NWFSC, Seattle WA, pers. comm.).

The AMR experience with EM of the halibut longline fishery and the crab fishery also suggests that cameras have sufficient resolution and coverage to monitor fisherman activity sufficiently to detect unauthorized discards. Determining the practicality of using cameras to monitor presorting, however, will take considerable experimentation. The layout of deck and factory will vary from vessel to vessel and structures that obscure the camera's view of the flow of fish could allow fishermen to presort unobserved. These and other factors will affect the amount of coverage necessary, and will require careful consideration prior to full implementation. A subsequent discovery of a blind spot in camera coverage for a vessel could bring into question previous data collected by the camera for that vessel.

3.4 Electronic logbooks

Electronic reporting of scientific, commercial, and recreational fishery data is increasing around the world. In many cases, electronic logbooks have been designed for management use to meet statutory data reporting requirements (vessel, gear, catch, effort, location, etc.). Electronic logbooks provide for easier data entry by fishermen, with fewer transcription errors from paper copies to electronic formats, and seamless downloading directly into to management databases. These features make the data much more useable for management and scientific purposes. Electronic logbooks combined with VMS position data would enable managers to attribute landings to specific areas, in much more detail than currently available. While electronic logbooks could be formatted to incorporate data collected by observers, this function is not explicitly discussed in this report, because NPGOP observers currently enter and transmit data through the ATLAS system.

Electronic logbooks also provide fishermen and fishing companies with a way to monitor fishing operations. The commercially-oriented logbooks range from simple formats with limited information entry to complex with options for extensive data entry. In some cases, management agencies enter into agreements with fishermen, who voluntarily provide logbook data. If fishermen find the electronic logbooks useful, they will more likely agree to support them, even with a government requirement to submit them to management and regulatory agencies. A number of management- and commercially-oriented logbooks are in various stages of implementation and development around the world. Virtually all systems are in some state of continued development.

Electronic logbooks have the capacity to collect and log data from various sensors. All sensors and data export systems used for on-board computer data logging should be compatible with

NMEA standards 0183 or 2000 (http://www.nmea.org/pub/index.html). The NMEA 0183 Interface Standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800-baud serial data bus. Each bus may have only one talker but many listeners. There is also a high-speed addendum, NMEA 0183-HS Version 1.0, to Version 3.01 of NMEA 0183. This standard operates at a 38.4K-baud rate. Specific sentence formats are common to both NMEA 0183 and NMEA 0183-HS and are defined in the NMEA 0183. The NMEA 2000 Standard contains the requirements of a serial data communications network to inter-connect marine electronic equipment on vessels. It is multi-master and self-configuring, and there is no central network controller. Equipment designed to this standard will have the ability to share data, including commands and status with other compatible equipment over a single channel.

3.4.1 Alaska Region Electronic Reporting System

The Alaska region of NOAA Fisheries has developed an Electronic Reporting (ER) System that is currently operational for the Alaskan groundfish fisheries (www.fakr.noaa.gov/er/). The ER System was developed by NOAA Fisheries to allow shoreside processors and processing vessels to submit Federal reports to NOAA Fisheries by electronic means. The Alaska ER system requires fishermen to type in all entries; no data are automatically recorded. The ER system is replacing the paper-based system of record keeping and reporting that was implemented in the late 1980s. This system required vessels and processors to maintain paper logbooks detailing fishing activity and catch. Processors summarized the logbook on a weekly basis and faxed a weekly production report (WPR) to NOAA Fisheries for entry into the database. Using the ER system processors can submit reports via e-mail or directly from their computer using a modem. The ER System is intended to help processors by making the reporting process simpler and more accurate. The ER System also helps NOAA Fisheries because the catch data reported by the processing vessels are downloaded directly into the NOAA Fisheries database. This eliminates the potential for data entry errors, which existed previously when NOAA Fisheries staff entered catch data into the database from the paper records.

The manager of a shoreside processor or stationary floating processor receiving groundfish from AFA catcher vessels or receiving pollock harvested in a directed pollock fishery is required to use the shoreside processor electronic logbook report (SPELR) or NOAA Fisheries-approved software to report every delivery from all catcher vessels (50CFR579.5(a)(4)). The owner or manager of a shoreside processor or stationary floating processor that is not required to use SPELR may use, upon approval by the Regional Administrator, SPELR or NOAA Fisheries-approved software in lieu of the shoreside processor Daily Catch Production Log (DCPL) and shoreside processor Weekly Processor Reports (WPR). Very few shoreside processors still use WPR, as most have converted to SPELR. Catcher-processors and motherships do not have requirements for ER, but may use electronic reporting for providing WPR to NOAA Fisheries.

The ER System consists of two principal components (www.fakr.noaa.gov/er/). The electronic reporting Client software is used by personnel on a vessel or at a shoreside processing facility to enter data and transmit data to NOAA Fisheries. The electronic reporting Host software runs at the NOAA Fisheries Alaska Region office in Juneau, Alaska. The electronic reporting Host system receives and logs transmitted files, validates the data, loads the data into an Oracle

database, and sends a return receipt report to the vessel or processing plant informing them of the status of their submission. The client software consists of a shoreside logbook and a processor vessel logbook.

Logbook record keeping and reporting are required for fishing vessels greater than 60 feet in overall length that participate in the BSAI and Gulf of Alaska groundfish fisheries (http://www.afsc.noaa.gov/Quarterly/jfm03/divrptsREFM3.htm). OceanLogic, an information technology consulting company in Juneau, Alaska has developed an electronic logbook for catcher vessels. The logbook was specifically developed to replace the NOAA Fisheries-mandated Daily Fishing Log (DFL) for Alaskan fisheries in state and Federal waters (Robert Mikol, OceanLogic, Juneau AK, pers. comm.). The logbook collects, stores, and archives a vessel's fishing data for compliance and analysis. NOAA Fisheries has approved the OceanLogic electronic logbook system as an alternate to the DFL. The electronic logbooks are currently compliant only for trawl catcher boats, but OceanLogic is working to make them also compliant for catcher-processors and motherships. Applications for other gears may be developed in the future. Electronic logbooks are an efficient method to provide improved access to more accurate and complete information on the fishing process. In addition, electronic logbooks store data in a format that allows vessel operators to use the data more easily and more productively to monitor and improve their own fishing operations. The OceanLogic electronic logbook could also perform as a data logging system for fishing activity data by polling sensors on board the vessels (Robert Mikol, OceanLogic, Juneau AK, pers. comm.).

NOAA Fisheries purchased 50 of the OceanLogic electronic logbook systems and provided them free to vessel owners who participated in research during 2003 to test observer deployment procedures as an alternative to the current method (David Ackley, NOAA Fisheries, Juneau AK. pers. comm.). The research tested use of a protocol to distribute observers more evenly across a fishery, in this case the rockfish-flatfish trawl fishery near Kodiak. More detailed location information available from the logbooks may allow for an analysis of spatial distribution of bycatch, although no such work has as yet occurred. Approximately half of the vessels voluntarily used the OceanLogic electronic logbook. NOAA Fisheries identified two limitations on using the electronic logbook (David Ackley, NOAA Fisheries, Juneau AK. pers. comm.):

1. Some of the data entered in the electronic logbook is self-reported. The self-reported information included errors, especially in reported target fishery. Without a program to reduce errors, NOAA Fisheries would not favor self-reporting of target fishery.
2. Most of the vessels lacked the ability to transmit data directly from the boats. The data were stored, transferred to plant or NMFS personnel, and then transmitted to NOAA Fisheries. No explicit infrastructure for data transmittal has been developed, and the existing infrastructure did not run smoothly.

3.4.2 Other regions

Currently, no region of the US other than Alaska requires electronic reporting of catch or production records. However, several systems are in development or are ready for application, as described below.

3.4.2.1 NOAA Fisheries Northwest Region

The NOAA Fisheries Northwest Fisheries Science Center has developed an electronic logbook – the Electronic Fish Catch Logbook (EFCL) (http://www.nwfsc.noaa.gov/logbook/index.cfm) – through partnership with Scientific Fisheries Systems, an information technology consulting company in Anchorage Alaska (http://www.scifish.com/newWeb/productIndiv.py?11). Most of the data would be entered by fishermen, and the system also allows for entry of observer data. The system has the capability of logging environmental data, such as temperature and conductivity, collected by sensors. The EFCL electronic logbook could also perform as a data logging system by polling sensors that monitor fishing activity. Sensors may be connected directly to the system, or data may be downloaded periodically from the sensors to the logbook. GPS data are collected automatically.

However, funding for completion of the EFCL is limited; NOAA Fisheries is currently trying to finish the system development and then turn the project over to others for implementation (Linda Jones, NWFSC, Seattle, WA, pers. comm.). A write-up for documentation of the project is underway, but has been delayed by personnel changes at NWFSC. A small pilot program to test the system for processors in California is in the planning stage, but a date for the test has not been set. The NWFSC has no plans for tests on vessels.

3.4.2.2 NOAA Fisheries Northeast Region

During June-September 2002, an electronic logbook reporting system was implemented in a study fleet of commercial vessels that fished for Northern shortfin squid (*Illex illecebrosus*) in the Northeast Region (http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0307/crd0307.pdf). Project objectives included the design of an electronic logbook reporting system that would fulfill the existing regulatory requirements for logbook reporting and that would improve the resolution, quality and timeliness of fishery data for stock assessments. The data collection process involved at-sea and web-based components. Catch, effort, depth, water temperature and location data were collected in real-time by vessel operators, on a tow-by-tow basis. Data were transmitted via e-mail to the Northeast Fisheries Science Center following each tow and at the end of each day by a satellite service provider and entered into an Oracle database. Upon completion of a trip, vessel operators logged onto secure, personal web sites that were password-protected and then verified the data entered at sea, assigned tows to specific trips and entered supplemental data required to meet existing logbook reporting requirements. The web site included an interactive mapping program that allowed vessel operators to visualize the spatial distribution of their data and to query their data to produce hardcopy logbook reports. The study demonstrated that electronic logbook reporting offers an efficient, cost-effective means of collecting accurate, high resolution fisheries and oceanographic data that are useful to fishermen, stock assessment scientists and fisheries managers.

3.4.2.3 Maine

Thistle Marine of Ellsworth Maine has developed a series of simple electronic logbooks designed for specific fisheries: lobster, crab, and multipurpose (www.thistlemarine.com). The unit connects to power and an onboard GPS using cabling supplied by Thistle Marine. Fishermen

manually enter the type and quantity of the catch found, including retained and discarded catch. The GPS location is recorded automatically after each haul when fishermen enter data. Data are sent by the fishermen to Thistle Marine over a phone connection. Thistle Marine analyzes the data and sends reports back to the fishermen either via US Mail or the Internet. The Maine Department of Marine Resources (DMR) considers that Thistle Marine electronic logbooks could be a valuable assessment tool, and is asking lobster fishermen to voluntarily provide electronic logbook data to the Department (http://www.state.me.us/dmr/Lobster%20Newsletter/Newsletter_feb_2002.htm#Thistle%20Marine%20Electronic%20Logbooks—Carl%20Wilson). To date, DMR has distributed approximately 75 units to fishermen from Maine to Massachusetts, and pays all costs associated with this program, including the cost of the box, installation and monthly fees, for those who volunteer data.

3.4.2.4 Science Applications International Corporation

The Automated Fishing Surveillance System (AFISS) was developed by Science Applications International Corporation (SAIC) of California to provide information on fishing activity, environmental and sea surface conditions in addition to vessel position data (http://www.saic-marinesciences.com/saic_marinesciences/pages/commercial_fisheries.htm). AFISS resides within a compact enclosure composed of an embedded microprocessor, a flash RAM memory card, several interfaces and a COTS Inmarsat transceiver. The embedded device contains the AFISS logic routines and sensor interface programs. The logic determines when the vessel is fishing by monitoring input from a winch sensor, and records the vessel's GPS position and time during trawling activities. After each haul the catch and by-catch information can be entered on a portable touch-screen device and transmitted along with the position information through the Inmarsat satellite system. The AFISS logic routines also save the position and sensor information to the memory card at sampling intervals defined within the program. The sampling intervals can be changed remotely. During trawling or long-lining activities vessel position, sea surface information like conductivity and temperature data are recorded and transmitted at pre-programmed intervals. In addition to the position data recorded by AFISS, the cumulative distance and speed-over-ground are also logged to memory during each haul. Data storage capacity within AFISS is sufficient to store two to three months of hourly records along with vessel position and sensor information. The memory cards store the data in ASCI-II format, and have a capacity of 80 megabytes. The AFISS program contains communications routines, which allow the stored data to be e-mailed when polled with the Inmarsat transceiver. Vessel position, speed, total distance, time and sensor data are transmitted after the haul with the catch information. Although SAIC has demonstrated AFISS, it currently has no users of the system (Stephen Pace, SAIC, pers. comm.).

3.4.3 Examples from outside the US

3.4.3.1 SHEEL, European Union

The European Union has begun development of a Secure and Harmonized European Electronic Logbook (SHEEL). The goal of this project is to develop and demonstrate an operational, cost-

effective and secure electronic transfer system that will convey logbook information to and between authority agencies in order to facilitate improved monitoring and control (http://intelligence.jrc.cec.eu.int/fisheries/sheel/index.htm, http://intelligence.jrc.cec.eu.int/fisheries/sheel/workshops/ispra_abstracts.htm). SHEEL is intended to improve quality and accessibility of logbook data. In its final form, SHEEL is intended to encompass all the existing manually treated reports that the skipper has to fill in. At the same time, the continuation of all the existing legislation on fisheries management and enforcement has to be guaranteed. The program will evaluate and test a number of on-board software packages already developed for supporting skippers of fishing vessels on their daily catch recording. Such packages vary from very simplified to very sophisticated. Vessel owners and skippers will participate in the development as the system is designed to be useful to fishermen as well as to management and enforcement.

3.4.3.2 Australia

The Australia Fishery Management Authority (AFMA) has set standards for electronic logbooks to be compatible with its databases; however, no mandatory electronic reporting occurs in Australia. (http://www.afma.gov.au/services/data/electronic/vendor/default.php). If fishermen wish to use electronic logbooks to submit required data, they must use an electronic logbook that meets the standards. Software developers wishing to develop an electronic logbook returns system must test their software with AFMA to demonstrate that the software will send electronic logbook reports which meet the AFMA specifications. AFMA has developed a set of performance measures that a software product must meet before AFMA will accept returns from these software products. Many of the electronic logbook reporting data specifications are fishery specific. AFMA is developing specifications for each fishery progressively. Specifications are developed when there is sufficient interest from a fishery. At least two systems – the OLFISH (Section 3.4.3.3) and the ECERS (Section 3.4.3.4) – have been approved for use in Australian fisheries.

3.4.3.3 OLFISH, South Africa

OLRAC, a fishery consultant group in South Africa, has created two commercial logbook systems: OLFISH-longline and OLFISH-trawl**,** software programs for capturing, storing and summarizing fishing data (http://www.spss-sa.com/olfish/software/body1.htm). The systems can be used by fishermen, managers, and scientists for longline and trawl operations and scientific surveys. Manually entered data include

- information about the company, factory, vessel, the start date of the trip and total fuel consumption of the trip;
- general information such as gear, bait, hooks, electronics and setting co ordinates;
- setting activity records such as setting distance, fishing depth and location, bearing, time type of fishing;
- hauling activity records such as location, bearing, time, and duration of haul, environmental data and catch data;
- environmental records of sea and weather conditions, and water and sea bottom physical characteristics

- catch data sheet records of quantity of processed fish products, skippers' catch estimates and fish sizes.

The GPS software component of the software is linked continuously to the GPS readout and a facility in the relevant data screens transfers this data into the database at a time chosen by the user. Alternatively GPS coordinates, date and time information can be input manually.

OLFISH is being presently tested, intensively in Australia, New Zealand and South Africa. In Australia, OLFISH was adopted as the electronic replacement of the logbook program by South East Trawl Fishing Industry Association and it complies fully with all Australian Fisheries Management Authority reporting requirements.

3.4.3.4 ECERS, Australia

The TerraSystems Group of Western Australia developed an Electronic Catch and Effort Reporting System (ECERS) used by the vessel's skipper to comply with regulatory requirements and assist owners and skippers to plan fishing operations (http://www.sat.com.au/ecers/ecers_index.htm). Catch data are entered on forms that perform the function of a logbook, with the ability to generate graphical plots and catch and effort reports in either electronic or paper form. Different data entry forms are available for different operations and reports. The appearance of these forms and reports is consistent throughout, providing the same data form for both the vessel's skipper and the land-based computers, irrespective of the type of data sent. Both the Form designs and the data entry configurations are customizable.

ECERS will provide real-time validation of Catch Positions against VMS Positions and validation of Catch against spatial status models using the VMS route to determine the catch prediction. It will maintain a database table of computed reliability indexes against each catch report, having compared a catch report against a spatial model. ECERS contains software for the vessel, the fleet owner and the fishing authority, all connected via an Email network. This allows a report submitted by a skipper to the fishing authority to be simultaneously copied and collated to a fleet owner and the skipper's home or office. Inspection Vessels can also utilize the software whereby the fishing authority can forward incorrectly validated Catch reports to provide targeted response and reasonable cause for catch inspections. Microsoft Outlook provides a robust MAPI environment offering both email spooling and encryption features. The Satlink Email system is recommended to submit catch and effort reports via Inmarsat-C.

3.4.4 Summary of benefits of electronic logbooks

Electronic logbooks are expected to have several critical advantages over hard copy logbooks with respect to providing data for fishermen, fishery research, and management (http://www.afsc.noaa.gov/Quarterly/jfm03/divrptsREFM3.htm, http://www.nwfsc.noaa.gov/logbook/lbdraft.cfm).

- Electronic Logbooks will make it easier for vessel operators to access and use their own data because they will be in an electronic format that can be used by a variety of existing and planned software packages. Fishermen can track catches against quotas, transmit and receive

marketing information, log information that affects fishing performance, and log economic information. For example, the European Union (EU) is currently finalizing the regulatory framework on labeling, food hygiene requirements and traceability (FAO 2002, http://www.fao.org/docrep/meeting/004/y3015E.htm). Traceability is defined by the International Organization for Standardization (ISO 8402:1994) as the "*ability to trace the history, application or location of an entity by means of recorded identification.*" The enforcement of traceability implies the development of systems giving information on the entire life cycle of food products, "from the farm – or the sea – to the fork." The European Commission-funded Concerted Action QLK1-2000-00164 "Traceability of Fish Products" (TRACEFISH) gathers 24 companies and research institutes from all over Europe to find common views on data which should follow fishery products from harvesting to the consumer. TRACEFISH seeks to achieve an electronic system of traceability where commercial partners transmit information on the fish they handle to a database through a unique electronic identifier applied to each package of fish (http://www.tracefish.org/). The US is also considering labeling and traceability requirements for food products. An electronic logbook compatible with traceability requirements would assist fishermen in complying with labeling requirements in the US and abroad.

- More timely data will be available to NOAA Fisheries managers and scientists because the data will be submitted more frequently and quickly and entered into a database automatically shortly after being received. With hard copy logbooks, vessel operators are required to submit copies of their logbook data to the Region within one month of the end of each quarter; therefore, timely data are not available even in a hard copy format. An end of trip transmittal could serve as a prior notification of landing to allow port samplers or enforcement officers to efficiently schedule activities.
- The quality of the data that are submitted to the Region will improve. First, the time and location for each haul set and retrieval are entered automatically using data from the vessel's GPS system. The vessel operator simply pushes a button at the beginning and end of each haul. Second, manually entered data can be validated for the use of correct codes or ranges of values. Third, the software that has been developed by the Region to receive the electronic logbook data checks for errors; and, if errors are found, the errors are flagged and sent to the vessel operator who submitted the data.
- The electronic logbook system can provide more information than is available from the hard copy logbooks. The data recording software that has been developed by OceanLogic automatically and frequently collects vessel location information during each tow. The logbook data currently includes just the set and retrieval locations, not frequent vessel location data.
- Increased timeliness, reduced errors, higher quality, and more information will improve understanding of fishing effort and CPUE and improve stock assessment.

3.5 Gear measurement

Scanmar, Simrad, Wesmar, and Northstar develop and sell systems for mobile fishing gear, primarily trawls, which allow monitoring of various sensors related to fishing activities. These systems use third wire or acoustic links to send signals from specific sensors mounted on the trawl net to a receiver that logs the information to a computer. NOAA Fisheries, other research agencies, and commercial fishermen successfully use these systems to improve performance of

trawl nets. The price varies for different components and manufacturers, and can range from several thousand dollars per component to 10s of thousands of dollars. These systems are not applicable for fixed gears such as pots and longlines. However, some technologies, such as RFID, are applicable to fixed gear.

3.5.1 Scanmar trawl monitoring

The Scanmar net measurement system consists of an array of sensors that allows for measurement of trawl net configuration in great detail, and for data logging into a computer. The sensors monitor depth off bottom, time on bottom, net symmetry, record of catch per haul, foot rope-head rope distance, distance between doors, trawl speed, etc. Scanmar does not have a sensor that directly detects bottom contact, but the "trawl sounder" sensor monitors foot rope location and the degree of bottom contact.

The Scanmar system comes in three configurations (http://www.scanmar.no/): ScanMate4 monitors four of the sensors, ScanMate6 monitors 6 of the sensors, and ScanBas monitors all available sensors. Both commercial fishermen and the research community use the Scanmar systems. The NOAA Fisheries Alaska Fisheries Science Center (AFSC) uses Scanmar systems on research vessels to monitor fishing activity.

3.5.2 Simrad trawl monitoring

Simrad has three net measurement systems designed for commercial fishing (http://www.simradusa.com/index.php?sub_it=commpro&page=page&c=3); two wireless systems and one with a third wire.

The FS20/25 Series trawl sonar is the Simrad third wire system, which provides real-time images from the trawl sonar heads and data from the sensors to the bridge. This system has been around for many years, but has received periodic updates. The FS series primarily provides visual depiction of the geometry of the mouth of the net; however, the system can measure trawl depth, bottom temperature, and sense the catch in the net. It has limited capability for data logging.

The Simrad ITI is a complete wireless trawl positioning and monitoring system designed to improve control and efficiency in pelagic and bottom trawling. Small battery powered sensors mounted on the trawl, transmit important information to the vessel on request. While the ITI system provides full visual display, data from the sensors and navigational instruments, logged in real time, gives valuable information of the trawl hauls. The ITI provides temperature, depth, distance and bearing of the sensors to the trawl, door spread or wing spread, and the catch.

The Simrad PI system is Simrad's new generation of wireless net measurement systems. It has modular sensors for net spread, headrope and footrope markers, bottom contact, depth, and temperature. The Simrad PI32 interfaces to Simrad echo sounders and sonars. One version is wireless, and another uses a third wire. The trawl measurement system has serial lines for interconnection to a data logger. Sensors use replaceable, rechargeable batteries.

The Simrad bottom contact sensor is part of the Simrad PI 32 trawl measurement system. The bottom contact sensor is attached inside the net on the bottom meshes immediately behind the middle of the footrope (http://www.simradusa.com/index.php?sub_it=docs&page=page&c=16). A heavy weight hangs through a penetration ring in the net, attached to the sensor with a detection chain and attached to the footrope with a stay. The sensor sends a signal to the receiving unit when bottom contact with the weight releases tension on the detection chain. The sensor sends a signal whenever tension is released (on bottom) and stops sending when tension occurs (off bottom). Bottom sensors can detect bottom contact with a precision of a few centimeters when correct stay and detection chain lengths are used. Optimal sensor performance requires that these lengths are configured with regard to both each other and the size of the bobbins or rock hoppers used on the trawls: bottom detection distance is relative to the diameter of the rock hoppers, bobbins or other gear in use. The computer on board that controls the PI 32 system logs the signals that indicate bottom contact.

3.5.3 Wesmar trawl monitoring

The Wesmar TCS770 is a third wire system that combines forward looking and profiling in one headrope unit (http://www.wesmar.com/trawl.html). Its split screen feature allows measurement of the net opening, profile of fishing circle, door spread, and other gear geometry. Catch sensors continuously indicate the amount of fish in the codend. A sonar component monitors the shape of the net. Wesmar does not have a sensor that directly detects bottom contact, but a down sounder sensor monitors foot rope location in relation to the bottom, and indicates when the foot rope contacts the bottom.

3.5.4 Northstar trawl monitoring

Northstar Electronics developed the NetMind trawl monitoring system with an acoustic link from the sensors to a hydrophone to measure parameters of commercial fishing nets and transmit the information back to the ship. The information is processed on a deck unit, displayed on a computer screen to enable the captain to see what activities are occurring in the net. The system has sensors for headline height, door spread, wing spread, temperature, and catch. NetMind does not have a sensor that directly detects bottom contact, but a down sounder sensor monitors foot rope location in relation to the bottom, and indicates when the foot rope contacts the bottom.

3.5.5 Other gear monitoring

RFID chips, about the size of a quarter, inserted into pot buoys can monitor the utilization of the gear (Howard McElderry, Archipelago Marine Research, Victoria BC, pers. comm. (see Section 3.3.2)). The chips largely eliminate pot robbing – a feature important to fishermen – and allow monitoring of pot numbers deployed against limits – an important feature for management. These features of the RFID chip work effectively with single pot per buoy, but would not monitor pot usage as well with multiple pots per buoy.

3.5.6 Work in development and application to other fisheries

The AFSC has developed a prototype scientific bottom sensor for use with trawl surveys to document the time of trawl contact with the bottom (Craig Rose, AFSC, Seattle WA, pers. comm.). The bottom sensor dangles from the foot rope, and tilts on contact. The sensor makes an electronic record of the time and location when tilting occurs. The data records stay within the sensor until downloaded to a wand that can transfer the data to a computer. The sensor weighs about 15 pounds and measures 3 inches by 12 inches.

Echosounders used for commercial fishing have improved substantially in quality in recent years. Some are approaching the quality of scientific echosounders (Bill Karp, NOAA Fisheries, Seattle WA, pers. comm.). Data logging of these echosounder records is routine. Acoustic data collected during normal fishing operations have been used for stock assessment and management. Approaches have ranged from extraction of subjective relative abundance and distribution information from uncalibrated echosounder displays to absolute biomass estimation from calibrated commercial or scientific sounders connected with data logging devices. As information needs expand and instruments capable of collecting scientific-quality acoustic data become more widely available, the need to evaluate the success of these approaches and consider factors which may influence data quality has become apparent. Most use of this technology will apply to providing temporal and spatial density distribution useful for stock assessment. While data logging echosounder data is likely more useful for scientific work than for fishery monitoring, it may be possible to relate fishing behavior with fish distribution.

4 Predicting bycatch for unobserved vessels

In this section of the report we discuss the various approaches that can be used to predict catch quantities for unobserved vessels. Use of various electronic monitoring and data logging systems will provide a suite of data, such as depth, precise location, fishing duration, and gear operation characteristics, for both observed and unobserved vessels. When combined with information collected from all vessels (size, gear, retained catch) and information collected from observed vessels (biological characteristics, total weight, species composition, bycatch, and discards), several approaches exist to predict the bycatch of unobserved vessels (Section 4.6). The approaches described below can be used to make estimates on a fleet-wide basis, on a co-op or other grouping basis, or on an individual vessel basis. The difference is a matter of aggregation of the data. The statistical approaches are not trivial, but are fairly well known. However, selecting the proper attributes to assure homogeneous categories for characteristics of interest is critical. For example, including attributes not related to differences in bycatch rates could result in clear, discrete groupings, but ones that don't represent similar bycatch rates. Demonstrating that attributes are applicable to the estimate required may be more difficult than developing the classification tree.

In combination, the various intensities of observer coverage – 100% (or "200%" in the case of two observers) to unobserved – present a complex array of issues to be addressed in consideration of bycatch prediction. Our goal here is to elucidate many of these issues, and then to suggest possible approaches by which these issues might be addressed. How one selects an

approach for estimation depends on the quantities to be estimated (Section 4.1), and on the resolution required (Section 4.2). Clearly defining these issues is critical to determining the most appropriate methods. No approach exists that is clearly appropriate for or will adequately resolve all of the issues involved with any degree of certainty. There may, in fact, not be a way to satisfactorily reach the desired goals at the present time. It seems clear, however, that an organized description of the problems involved is needed if a coherent solution is ever to be identified.

4.1 Definition of desired predictands

Before it is possible to develop approaches for prediction of bycatch, there is a need to precisely define those quantities for which prediction is desired, namely the *predictands* of interest. Bycatch may refer to many distinct quantities, including the total weight of "non-target" catch (species or species and size), weight of non-target catch identified by species and/or size, and weight or number of "prohibited species" (weight or number possibly depending on species identity). Statistical prediction involves the prediction of unobserved random variables, which cannot be left vague in terms of definition. Prediction of the number of halibut caught in a pollock fishery may require an entirely different approach than prediction of the total weight of rockfish caught, or the total weight of non-target species, or the total weight of discarded catch. Without a clear enumeration of the desired quantities to be predicted, little additional progress can be made.

4.2 Resolution of desired predictands

Hand-in-hand with clear definition of the quantities to be predicted is the *resolution* or scale at which prediction is desired:

- for an entire fishery,
- for particular time frames within a season for an entire fishery,
- over a given geographic area for a given time frame,
- for groups of vessels over a given window in space and/or time,
- for a given vessel over a certain window in space and/or time,
- for a given vessel on a given trip,
- for a given haul on a given vessel on a given trip,

Predictions at all these levels of resolution result in the definition of different random variables. And, again, it is the values of unobserved random variables that constitute a statistical prediction problem.

The combination of quantity definition (item 1 above) and desired resolution in space, time, and vessel group or fraction (this item) allow definition of a set of random variables to be the object of prediction. Defining these issues is required to determine whether existing observer coverage is "adequate," or to make progress in improving the assessment of bycatch for unobserved situations, either for fisheries as a whole, vessels, groups of vessels, trips, groups of trips, hauls or groups of hauls. Otherwise, there will be no manner in which to answer the questions of what

coverage is to be adequate for, what level of uncertainty exists in current operations, or what degree of improvement might be possible by either changing current observer deployment strategies or introducing new technologies for monitoring vessel behavior.

4.3 Relation of observed population to prediction set

Any method of prediction assumes a relationship between cases for which observations are available and those for which observations are not available (and are, hence, to be predicted). The simplest of these assumptions are those that take unobserved cases to be, in some sense, *noninformative* about the quantity of interest. That is, the lack of information on the quantity of interest provides no information about what its value might be. These assumptions are sometimes called assumptions of *missing completely at random, missing at random, or noninformative missingness*. Although there are technical differences among these three statistical assumptions, they share in common the characteristic that unobserved values of the quantity of interest constitute a subset of all or a portion of all cases in which this quantity is observed. It is difficult, if not impossible, to predict the value of a quantity if no observations are available on "like cases." The fundamental importance of this issue becomes clear if one asks whether vessels that never carry an observer can be considered a random subset of vessels that do carry an observer, or if vessels that only sometimes carry an observer behave in the same manner (relative to the quantity of interest) on observed and unobserved trips. While it is likely that, in the absence of either total observer coverage or special studies that provide observer information for cases that are in general unobserved, this issue will remain one for which unverified assumption plays a key role, there may be some avenues by which the confidence (in a non-technical sense) of assumption may be bolstered. Specifically, the approaches envisaged here take a quantity of interest for a case indexed by i, Y_i say, to be predicted on the basis of a set of covariates $\mathbf{x}_i=(x_{i1}, \ldots, x_{ip})^T$ which are observed for case i. If both the relation between Y_i and $\mathbf{x}_i$ used for prediction and the Y_i itself are missing in a noninformative manner, then the methodology used for prediction of Y_i should also prove effective in the prediction of $\mathbf{x}_i$. Because the components of $\mathbf{x}_i$ have, in fact, been observed, this allows for an assessment procedure in which one or more components of $\mathbf{x}_i$ are predicted on the basis of the remaining components. The discrepancy among predicted and observed values may then be assessed as an indication of whether those quantities might be considered to reflect noninformative missingness. If all of the components of $\mathbf{x}_i$ appear to reflect this characteristic then that lends some credence to the assumption that such is also true of the quantity of interest Y_i, while if this is not true it casts doubt on any methodology used that relies on such an assumption.

4.4 Aggregation effects and prediction of ensembles

Closely related to the issue of predictand resolution (Section 4.2) are the effects of aggregation and the issue of ensemble prediction. These issues may be understood as follows. Aggregation effects concern possible differences between the prediction of an aggregated quantity and the aggregation of a set of predicted quantities. For example, there is no mathematical reason that prediction of a quantity at the fishery level should agree with the sum of predictions of the same quantity at the level of vessels. Typically, the prediction of an aggregated quantity (e.g., total

bycatch of a given species in a fishery) will have less uncertainty associated with it than aggregation of predictions made at a finer scale of resolution (e.g., the sum of vessel-level bycatch predictions for a given species). The issue of ensemble prediction concerns a similar phenomenon, which is that a predictor derived to be optimal (according to some formal criterion) for prediction of an individual case may not be optimal for prediction of the sum of those cases. Our view at the current time is that aggregation effects will be more prominent in the prediction of bycatch than the issue of ensemble prediction because it is unlikely that formal prediction criteria (such as mean squared prediction error) will be available for the derivation of optimal predictors in this problem. Nevertheless, it may be prudent to identify this as a prediction issue at this point.

4.5 Static prediction versus dynamic prediction

The potential methodologies discussed briefly in Section 4.6 all constitute what may be considered *static* predictors, in that they take the relation between quantities to be predicted (i.e., predictands) and quantities on which such predictions are based (i.e., predictor covariates) to remain stable over the temporal and/or spatial window in which predications are made. This is a critical matter, particularly in the case that predictions are made in a current situation (e.g., this fishing season) on the basis of relations developed from previous situations (e.g., past fishing seasons). The alternative is to rely on dynamic methods in which the relations among various quantities of interest are allowed to vary, within certain limits imposed by model structure, over the course of time and/or space. This is a difficult issue for the development of prediction strategies, particularly if the behavior of fishing vessels may change as the result of regulatory or monitoring efforts. At the current time there appears no alternative but to assume that the past reflects the present in terms of the prediction problems formulated (which depends on the first two issues discussed previously). It may well be beneficial, however, to consider the issue of how to detect changes in the relations on which predictions are based (assuming that such relations can be identified) in the most rapid manner possible.

4.6 Prediction based on regression methodologies

One of the fundamental approaches to prediction of unobserved random variables is that of regression methodology. Consider a set of non-random indices $\{\mathbf{s}_{i\,:\,i=1,}\ldots,n\}$ which index the position of associated random variables in space, time, and definition of observational unit. For example, $\mathbf{s}_i$ may denote a combination of vessel identification, trip number, and haul number. Alternatively, $\mathbf{s}_i$ may denote a combination of vessel group, geographical area, and portion of a fishing season. Associated with these indices are random variables $\{Y(\mathbf{s}_i)\text{: } i=1, \ldots,n\}$ which represent the quantity of interest, such as total weight of discards, number or weight of a particular taxonomic group, etc. Definition of $\mathbf{Y}\equiv\{Y(\mathbf{s}_i)\text{: } i=1, \ldots,n\}$ must come from consideration of the first two items discussed above; without such definition progress will not be possible. Technically, $\mathbf{Y}$ denotes a *random field*, and $\mathbf{s}_i$ a *location* within that field. Now consider an additional location $\mathbf{s}_0$ at which the quantity of interest $Y(\mathbf{s}_0)$ has not been observed. The goal is to predict $Y(\mathbf{s}_0)$ on the basis of observations $\mathbf{y}\equiv\{y(\mathbf{s}_i)\text{: } i=1, \ldots,n\}$. Suppose that a set of variables $\mathbf{x}\equiv\{\mathbf{x}(\mathbf{s}_i)\text{: } i=1, \ldots,n\}$ has also been observed and that the value of these variables $\mathbf{x}(\mathbf{s}_0)$ is also available at location $\mathbf{s}_0$; here, $\mathbf{x}(\mathbf{s}_i)\equiv(x_1(\mathbf{s}_i), \ldots, x_p(\mathbf{s}_i))^T$ is a vector of covariates at location $\mathbf{s}_i$.

The underlying concept in regression prediction is that, for i=1,. . .,n, $Y(\mathbf{s}_i)$ is related to $\mathbf{x}(\mathbf{s}_i)$ by a regression equation, $E\{Y(\mathbf{s}_i)\} = h(\mathbf{x}(\mathbf{s}_i), \beta)$, where E is the expectation operator and β is a vector of unknown parameters. Often, the function h(.) is chosen to be linear in the parameters β, but this is not necessary if additional knowledge is available that suggests an alternative form. The observed data are used to estimate values for β, as B say, and then these estimated parameters are used in the functional form of h(.) to produce a predicted value for $Y(\mathbf{s}_0)$ as, for example, $p(\mathbf{s}_0) = h(\mathbf{x}(\mathbf{s}_0), B)$. This approach often suffers from one or more complications, even if a linear form for the response function appears adequate. Notable among these complications are linear dependencies among the component quantities that make up the $\mathbf{x}(\mathbf{s}_i)$, and the fact that various groups in the total population may contain different simple regression relations with the responses of interest (i.e., the $Y(\mathbf{s}_i)$s).

The difficulty of linear dependencies among components of the covariate vectors $\mathbf{x}(\mathbf{s}_i)$ is called the problem of *colinearity*. The problem this causes is that estimates of the parameter vector β tend to be numerically unstable, with the obvious negative implications for prediction. One standard approach to dealing with this problem is to construct new covariates as linear combinations of the original components of the $\mathbf{x}(\mathbf{s}_i)$, in such a way that the new covariates are orthogonal. Typically, this is accomplished through the use of *principal components analysis*. The principal components (i.e., linear combinations of the original covariates) are constructed in such a way as to account for a large amount of the overall variance contained in the set of original covariates. The new covariates may then be used in a regression for the attribute of interest. While often an effective approach, the potential problem with this type of principal components regression is that there is no guarantee that the principal components constructed will account for variability in the responses of primary interest.

The second potential problem identified above is caused by the presence of distinct clusters or strata within the entire population. In such situations, one approach to the prediction of $Y(\mathbf{s}_0)$ is that of *treed regression methods* (Alexander and Grimshaw 1996), which encompass methods that rely on *recursive partitioning* and, most notably, *classification and regression trees*, which are often referred to as CART methods (Breiman *et al*.1984). In this approach, binary splits are sequentially formed in the data (hence the "tree") with each terminal "node" resulting in a simple linear regression equation for the variable of interest. This methodology has, for example, been applied to the response of blue shark catch per set in the Hawaii commercial longline fishery (Walsh and Kleiber 2001) although prediction was not the primary objective of that analysis.

In both of the above approaches, the quantification of uncertainty in predicted values becomes a complex issue. Particularly in the case of regression trees, use of linear model theory to derive standard errors of predictions at each of the terminal nodes of the tree ignores uncertainty in the process of tree development through the sequential splitting of data. Predictions are then appropriately thought of as conditional on the tree structure. The entire process then leads to an underestimate of the actual uncertainty that will exist in a set of predicted values. Cross-validation may serve as a valuable tool in assessing the degree to which this occurs, but the basic problem is not solved. An alternative is to employ a Bayesian approach, making use of either *multiple imputation* or *Gaussian process priors.* Multiple imputation makes use of multiple predictions of the same quantity, all generated from an appropriate posterior predictive distribution (e.g., Little and Rubin 2002). An immediate measure of prediction uncertainty is

provided by the variability among the multiple predictions so generated. The concept of Gaussian process priors is that, rather than formulate a model in the typical manner by assigning prior distributions to model parameters, one might derive the posterior predictive by first integrating out model parameters and then assign prior distributions directly to the observable data values and covariates of the case(s) to be predicted (Neal, 1998). Both of these Bayesian approaches offer alternatives that may prove applicable to the prediction of bycatch quantities.

5 Integrated electronic monitoring system

An EM system could range from a basic VMS providing location information to a complex integrated system of video cameras and multiple sensors linked through an electronic data gathering system such as an electronic logbook. When at-sea observers ride along on vessels with EM, observer data could also link to the EM system. As described in Sections 2 and 3, a wide variety of technologies exist that can obtain and analyze information from fishing activities. Some of these technologies are currently in wide use, some are in use for limited applications, and others are in development. The most effective use of the discussed technologies for the groundfish fisheries off Alaska may be through some sort of an integrated EM program that uses at-sea observers, at-sea electronic and video monitoring, electronic logbooks, and shoreside measurement of landed catch. The FSCS system (Section 2.5.2) currently provides many of these integrated features.

EM may obtain and store more data from fishing events than can be practically analyzed. Cataloging the data as a preliminary analysis would set up the data for storage and subsequent analyses, and could examine the data for anomalous events. More detailed analyses could occur according to specific research or management questions.

These technologies may provide the most practical supplement or alternative to at-sea observers in the Alaska groundfish fisheries. Many at-sea processors currently weigh fish with motion-compensated flow scales and have one or two observers for all fishing days. NOAA Fisheries receives detailed information from shoreside processors, which weigh fish on certified scales. Large improvements in data quality for catcher vessels delivering to shore-based plants will come from more precise at-sea monitoring for location information, from improved estimates of bycatch and discards, and from monitoring fishing activity.

Currently, NMFS receives landings reports by NMFS management area and ADF&G statistical area, which are broad areas. Data from observed vessels are extrapolated to unobserved vessels by gear type and management area. However, if an electronic logbook provides exact fishing locations and durations, the catch can be attributed to areas at a much finer resolution. This should enable managers to better identify areas of high bycatch and provide managers with better ability to extrapolate catch from observed to unobserved areas. NMFS would also be better equipped to quantify the observer effect. For example, patterns of observed vessels consistently fishing in different times and areas than unobserved vessels could be investigated. Bycatch and discards from the unobserved vessels can be estimated through the data processing and data analysis procedures that use and compare fishing information from unobserved vessels with that of observed vessels (Section 4.6). Data analysis could take two predominant forms: 1) using

patterns in fishing practices of observed and unobserved vessels to make fleet wide estimates of bycatch and discards, and 2) using information from observed vessels to build a bycatch prediction model using groundfish species composition, gear, area, time, depth, etc. for use in calculating bycatch for individual vessels.

5.1 Components of integrated electronic monitoring

The composite EM system is an integrated system, using a variety of components discussed individually in earlier sections to collect a series of data. In some cases, data could be automatically logged in a format ready for downloading to a database (e.g., GPS locations, gear sensors). In other cases, data could be stored on a computer for later processing (e.g., camera images). In still others, data would be input manually (e.g., catch data). Depending on management needs and transmission costs and capabilities, some data elements could be reported directly to management agencies with VMS on a real-time, regularly scheduled, or interrogation basis. For after-the-fact monitoring, data could be stored in computers for transmission at the end of a fishing trip. Electronic logbook systems could poll the various sensors and log them with the VMS location data. All data would have date, time, and location stamps confirmed with a verification system to facilitate linking haul-by-haul information (Robert Mikol, OceanLogic, Juneau AK, pers. comm.).

In general, transmission costs would likely limit the amount of data transmitted directly through a VMS. Therefore, a composite EM with a variety of data sources would likely require computers for logging, processing, and transmitting data: one computer that receives and stores information on the fishing activities, and another that receives and stores video from cameras that monitor fishing operations.

Electronic logbooks have been developed around the world, largely with benefits to the fisher as the driving force. Many of the electronic logbooks have the capacity to automatically log in a variety of fishery data, and as such, are an important component of a composite electronic monitoring system. An electronic logbook designed to assist – and accepted by – fishermen, with a capacity to log fishery data required by fishery management programs, would have the highest likelihood of succeeding in practice as the data logging format. Two electronic logbooks designed for northeast Pacific fisheries – the OceanLogic electronic logbook produced for Alaskan fisheries and the EFCL produced by Scientific Fisheries Systems for the NWFSC – could fit this description.

VMS are in use around the world for a variety of monitoring and surveillance purposes. VMS data have been used to successfully prosecute vessel operators for entry into a closed area, but at present, VMS alone cannot categorically demonstrate, sufficiently for prosecution in a US court of law, that a vessel has fished. Other information is required to demonstrate when a vessel actually fishes.

Various types of sensors can be used to record the use of fishing equipment. Rotation counters on winches or line pullers and pressure monitors on hydraulic systems will indicate when and to what extent fishing gear has been activated. However, fishermen may activate this equipment

without actually fishing. For example, trawlers may tow a net with the codend open to remove fish residue. Pot fishermen may set pots to store them at sea. Although such activities make up a small proportion of gear sets, some mechanism is required to distinguish between gear operation for fishing and gear operation for other activities. For vessels that increase engine speed during setting or retrieving operations, a pyrometer would supplement VMS and fishing gear sensors and help to confirm whether fishing is occurring. Trawl vessels would generate much higher exhaust temperatures during fishing than during net cleaning because towing a closed codend, particularly with fish, would require much greater engine power than dragging an open codend (Robert Mikol, OceanLogic, Juneau AK, pers. comm.). Pot and trawl vessels do not need to increase engine speed during gear setting, but the fishing gear goes over the side in a sequence. The laser-based hook counter under development by Digital Observers could determine when hooks and pots go over the side. Catch data entered in electronic logbooks would indicate that fishing occurred, and video monitoring of the deck could provide confirmation that fishing occurred when no catch data are indicated.

Camera images could add a powerful component to EM through monitoring catch and discards and through monitoring fishing activities. However, fishermen may resist use of cameras because of confidentiality issues. Fishermen are concerned that someone (e.g., an environmental group or a plaintiff's attorney), through the Freedom of Information Act (FOIA) and/or subpoena, will obtain video images collected by a government management agency and use them for unintended purposes (Paul MacGregor, Mundt MacGregor, Seattle WA; Mark Buckley, Digital Observers, Kodiak AK, pers. comm). At this time, the only sure way to avoid FOIA for video images is to have the vessels own the camera system and the images, and loan the images to the government for analysis.

5.2 Mechanisms for enhanced electronic monitoring

Two possible mechanisms are considered for implementing a composite electronic monitoring: A *Regulatory Mechanism* and a *Standards Mechanism*.

Regulatory mechanism – The Council/NOAA Fisheries would develop the composite electronic monitoring, in partnership with a vendor, and specify through regulations all of the detailed procedures that vessels would have to follow to participate in the enhanced EM program. This process would closely follow the approach used to define the requirements for SPELR or the model development for the EFCL. Under a system fully defined in regulations, all fishermen would operate under the same system with equal treatment. But fishermen and vendors would have minimal opportunity for innovation to improve the system.

Standards mechanism – The Council/NOAA Fisheries would specify performance standards for the composite electronic monitoring. Vendors would develop an integrated EM and demonstrate that it meets the standards following a successful trial of hardware and software. NOAA fisheries has used this approach to define the requirements for scales in processing plants for weighing groundfish, in which each plant established its own program that met or exceeded the standards, unique for the plant. AFMA currently uses this approach for approving electronic logbooks.

Whichever mechanism is used, the Council and NOAA Fisheries need to agree on what constitutes a satisfactory implementation for an integrated electronic monitoring, so that this can be used to define the regulation, or in the evaluation of plans proposed to meet the performance standards. The Standards Mechanism will provide greater flexibility, reduce the administrative burden on NOAA Fisheries, and place some of that burden on the participating industry. However, NOAA Fisheries would have to monitor the EM systems to assure they continue to meet standards. Under this approach, NOAA Fisheries and the Council would determine which aspects require regulatory management, while the participating vessels would prepare implementation plans describing how participants will achieve the performance standards for other aspects (defined in regulations).

6 Conclusions and recommendations

6.1 Conclusions

Because NOAA Fisheries currently obtains adequate data on weight, species composition, and biological samples from landed catch, the main emphasis of improved at-sea data collection is on obtaining data on species discarded at sea. Many more options are available for larger vessels than for smaller vessels and larger vessels often have significant requirements for data collection, especially those vessels participating in CDQ or AFA fisheries. Larger vessels already have one or two observers on board for all fishing activities, and have more space and protection for motion-compensated scales, conveyors, etc. Large trawl vessels often have net measurement systems that could supply data to an electronic logbook on many fishing activities. The technology available for larger vessels is often unsuitable for smaller vessels because of space limitations and cost. It does not, therefore, provide viable solutions for improving bycatch estimation for smaller vessels. Some combinations of technology suitable for smaller vessels have been described in this report, and may lead to feasible electronic monitoring for these vessels.

6.1.1 Management measures and electronic monitoring

Fisheries management measures often require or presume that fishermen operate their gear in a particular way (e.g. regulations designed to eliminate or reduce undesirable behavior that might increase bycatch or fishing off-bottom when pelagic trawls are required). However, substantial latitude remains within which fishermen can decide how and where they go to fish. Fishermen still have widely varying bycatch (and catch) rates, which may be the result, to a greater or lesser extent, from the way in which they fish. New technology might be used in conjunction with various types of controls on the operation of vessels and gear in the North Pacific**. Table 4** contains a description of electronic monitoring activities that may apply to general management measures.

6.1.2 Catch composition and quantity

Table 5 presents a summary of the technologies applicable to monitoring catch composition and quantity. For the foreseeable future, observers are likely to be the best source of biological information from vessels at sea. Using crewmembers from a vessel to collect biological data from unobserved vessels is possible, but many scientists and managers will not trust, and therefore not use, the data. However, developing incentives for fishermen participation and monitoring data collection with video cameras may provide for data of sufficient quality to improve estimates compared to estimates made with no data from unobserved vessels.

Video cameras are not likely to provide automatic identification of fish, seabirds, or protected species for the foreseeable future. Remote observers are used to identify and enumerate fish from video images in cases where fish pass by the camera as non-overlapping single images. Improvements are expected for video and remote observer capabilities. Remote observers can also count numbers of hooks or number of pots set by a vessel. They can also identify many species with accuracy comparable to at-sea observers, but some difficult-to-identify species must be grouped. Low light levels, specimens not in focus or out of the field of vision, and obscured subjects reduce the ability of remote observers to identify fish. Adequate lighting and proper placement and protection of the cameras will require some experimentation before they can be deployed effectively.

Video images may provide for remote observer counts of bycatch of seabirds, marine mammals, or other protected species. Insufficient experience exists to determine the capability of remote observers to identify protected specimens to species. Accuracy could improve if crew members placed this bycatch in the view field of a close up camera, but such a requirement could increase time and cost of fishing operations.

Motion-compensated flow scales work well for weighing total catch on many catcher-processor trawler vessels, although some smaller vessels have configuration problems. Motion-compensated hopper scales could estimate total weight for catcher-processor longline and pot vessels, but may cause a space problem for smaller vessels. Motion-compensated scales will be problematic on vessels without shelter to protect the scales from the wind and waves, i.e., all catcher vessels. Motion-compensated flow or hopper scales could also weigh discarded catch, but the space required for a second scale could cause severe disruptions and expense for the vessels.

Technological methods can only partially monitor bycatch and discards from unobserved vessels. Regression methods can improve the estimates of unobserved bycatch and discards by using fishing attributes of observed and unobserved vessels obtained with technological means. Fishing attributes used in a regression model must relate to bycatch or spurious correlations may occur.

Several technological improvements to observer sampling equipment are currently available, but have high costs. Electronic measuring boards, electronic scales, and hand-held or tablet computers currently used for scientific surveys would allow for easy and accurate data collection by observers. Direct entry of data to a computer by observers or from electronic measuring devices will result in reduced transcription errors, faster data collection, fewer errors, and less

need for data entry staff to enter data from paper forms (North Pacific observers enter data at sea with electronic transmission to the Observer Program). Feedback to observers from automatic error checks will also provide a learning experience for the observers likely to reduce similar errors in the future. These pieces of gear cost from three to five thousand dollars each, and a single observer could require $10,000 or more worth of equipment. Most observer programs do not have a budget that allows for purchase of all this equipment at a level to supply all observers. Tests of the electronic equipment in field situations comparable to observer conditions in the North Pacific have resulted in some equipment failure. Observer program managers may selectively purchase electronic devices for a particular need, but will unlikely take full advantage of technological improvements until costs decline and managers have confidence in reliability.

6.1.3 Fishing activity

Table 6 presents a summary of the technologies applicable to monitoring fishing activities. VMS (Section 3.1) can provide accurate, frequent position fixes for fishing vessels, but is not sufficient for monitoring fishing activity. Other technology, such as sensors that monitor fishing gears (hydraulics, rotation counters, exhaust temperature, bottom sensors, etc.), can help to confirm when fishing is occurring (Section 3.2, 3.5). Recording the VMS and sensor data automatically in a computerized data logging system, such as an electronic logbook (Section 3.4), will be a key for making the data accessible. The amount of data collected under such a program maybe too large for economic transmission of an entire dataset via the VMS, but secure data storage on a computer makes the data available for downloading to a management system upon return to land.

Future developments or applications of signal processing to the integrated sensor data may allow for identifying signatures of fishing behavior, e.g., fishing events. Summaries of the data that identify specific events, such as hauls/sets or transiting, could be sent via VMS to management agencies for monitoring of activities. Agencies could monitor summaries of specific fishing activities in near-real time, while a full data set of all activities resides on an on-board computer for periodic download to the agencies.

Remote observers viewing digital video images can monitor many fishing activities: presorting, use of bird scaring devices, marine mammals in trawl chute, etc. The monitoring will have direct enforcement implications, by documenting illegal actions or confirming compliance. However, any features (shadows, stacks of gear) or activities (standing in front of the camera) on vessel that obscure the view of the point of interest could jeopardize the integrity of the video. NOAA Fisheries must assure that placement of cameras maintains clear lines of sight.

Fishermen will likely find an EM system that requires VMS, sensors, an electronic logbook, and video cameras intrusive and costly. Opposition will arise unless the fishermen recognize a personal benefit that exceeds the costs. Some fishermen in Alaska voluntarily use an electronic system to comply with mandatory reporting requirements. Some Alaskan fishermen have also voluntarily used an electronic logbook. These voluntary activities represent a small proportion of the overall groundfish fleet. It is not clear what inducements would convince fishermen to support such an EM system. However, management measures implemented with the support of the fishermen seems vital for the system to prove effective. Support could come from addressing

two key factors: 1) basing management measures on reliable scientific advice that fully justifies the need for the measures, and 2) understanding the socio-economic circumstances of the fishermen, to avoid measures which cause unacceptable hardship and to promote cooperation between the fishing communities and the regulatory authorities. In this spirit, management measures to enhance the observer program will gain the greatest support if the requirements are helpful to fishermen. If they provide a value, the fishermen will have less of a problem using the system. Potential benefits to fishermen could come from:

- Web-based data retrieval of data by owners, operators, and partners. The Thistle logbook was designed for fishermen, and has web-based access to data. Qualcomm (http://www.qualcomm.com/qwbs/products/viaweb/index.html) has developed several products that allow web-based information tracking and exchange.

- Fish sales prior to a vessel landing fish currently occurs for many fisheries in the North Pacific region. Sales often occur by ship-to-shore radio or mobile phone. In Europe, direct sales of fish from vessels at sea through on line auctions bring an opportunity for increased profits (http://www.intrafish.com/intrafish-analysis/UK_2000_48_eng/index.php3?thepage=5).

- Fleet or vessel managers could make better business decisions using information in an integrated EM system just as Schneider Trucking has improved management of its fleet of trucks through an online tracking system that monitors location, engine sensors and trailers.

- Recently approved legislation to require country-of-origin labeling for wild fish (http://thomas.loc.gov/cgi-bin/cpquery/?&dbname=cp108&maxdocs=100&report=hr401.108&sel=TOC_88536&) will require fishermen to meet documentation standards. Electronic logbooks can be formatted to provide the documentation needed for full traceability.

- Development of an EM system that includes sufficient information to categorize unobserved vessels with observed vessels for bycatch and discard estimation may allow for increased levels of monitoring without substantial increases in the number of on-board observers. Redistribution of on-board observers to currently unobserved vessels and use of EM more widely than the current distribution of on-board observers could increase the overall level of monitoring and data collection. Some redistribution of observer coverage may be contingent on a program as part of the EM system for biological data collection by fishermen that meets the needs of managers/scientists and fishermen.

6.2 Recommendations

Three key components of a system to enhance monitoring of bycatch and discards emerge from this paper: an electronic logbook linked with VMS and key sensors; video camera coverage; and estimation of bycatch through a regression model analysis. In addition, electronic equipment for observers could reduce errors and reduce time required for data collection. These technologies are not yet mature to the point that readily-available applications exist that completely meet the

needs of NOAA Fisheries and the Council. However, experience in the northeast Pacific and around the world suggests significant potential for these technologies to contribute to fishery management in Alaskan waters. More detail on the application of these technologies is presented below, but more analysis, pilot programs, and consultation with stakeholders by NOAA Fisheries and the Council is likely necessary before implementation of any of these methods could occur. Some technologies are suitable for specific monitoring purposes, and care must be taken to ensure that a technology is suitable for the problem addressed. The details of these components will differ by gear type and by the types of information most critically needed for management. Observers in the North Pacific use data collection and logging methods that take several steps. Each step takes time from other possible activities and is a potential source of error. Cost effective electronic measuring and logging will enhance the observers' capabilities.

1. Evaluate an electronic logbook (Section 3.4) linked with VMS (Section 3.1) and key sensors (Section 3.2, 3.5) to provide detailed information on location and fishing characteristics. Many of the attributes captured in an electronic logbook would provide input to the regression model (below); a comprehensive analysis of the contribution of these attributes to variation in bycatch rates or quantities (or to other topics of interest) will increase the probability of choosing the correct attributes. The attributes obtained automatically without input from fishermen – location, depth, winch or engine sensors, etc. – would have higher reliability than attributes that fishermen may collect – species composition, catch weights, biological data, etc, although EM can help monitor if fishermen follow proper protocols. Further evaluation of fishermen participation in data collection under a bonding-type program comparable to weighmasters would determine advantages and disadvantages of the concept.

2. Evaluate video camera coverage (Section 2.1, 3.3) to increase compliance with regulations (such as unsorted samples for observers) and to provide counts and identification of species. The confidentiality issues for video monitoring may limit acceptance by fishermen, and require further analysis.

   A test on the Pacific whiting fishery demonstrated the potential for cameras to greatly reduce and possibly prevent unauthorized discarding of fish from shore-based trawlers, and the whiting fishery will use electronic monitoring in 2004. Remote observers identified presence of seabirds caught on halibut longlines and obtained moderate accuracy for species identification. Cameras demonstrated use of required gear or gear modifications, as in a test of compliance with bird avoidance devices in the halibut fishery. Remote observers for the Canadian Pacific halibut fishery identified many fish species from video images at accuracy rates similar to at-sea observers. Use of video monitoring for the US Pacific halibut fishery also seems feasible.

   Random checks of video records from all vessels and checks of video records of vessels with anomalous VMS/sensor/electronic logbook data would increase efficiency in monitoring the large quantity of video that would result. Cameras could also help check and confirm that fishermen correctly collect data should they participate in data collection programs.

3. Evaluate a regression model analysis (Section 4.6) to compare observed and unobserved vessels to improve estimates of unobserved bycatch. Conduct research to determine which attributes contribute the most information to bycatch estimation. While Section 4.6 describes several regression techniques, no testing or evaluation of them has occurred for application to fishery bycatch estimation in Alaskan waters. The methodology has been applied to Hawaiian blue shark fisheries, but not for purposes of prediction.

4. Nationally coordinate a cost effective, integrated electronic data collection and logging system for observers. Evaluate which systems provide benefits that exceed costs for the Alaska and other regions. Work with manufacturers to develop electronic measuring boards (Section 2.5.2) and electronic scales (Section 2.5.2) at low enough cost to distribute to observers. The observer boards would not need all the features of a board used for scientific surveys. Observer boards and scales should be robust enough to withstand the rigors of traveling with observers, operate in extreme conditions at sea, and have a standardized (preferably wireless) link to a hand-held or tablet PC. Eliminate data recording on plastic sheets, and convert to direct entry on tablet or hand-held PCs that have adequate readability and reliability.

References

AFSC. 2003. North Pacific Groundfish Observer Manual. North Pacific Groundfish Observer Program. Alaska Fisheries Science Center, 7600 Sand Point Way N.E., Seattle, Washington, 98155.

Alexander, W.P. and Grimshaw, S.D. (1996), Treed regression. *Journal of Computational and Graphical Statistics*. **5**, 156-175.

Ames, R. N. T., G. H. Williams, and S. M. Fitzgerald. 2004. A project to test the use of digital video for monitoring the compliance of seabird avoidance devices and seabird mortality in halibut longline fisheries. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2003: 329-330.

Ames, R. N. T. 2004. The efficacy of electronic monitoring systems: A case study on the applicability of video technology for fisheries management. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2003: 331-332.

Borque, C. and Cairns. 1994. Efficiency and accuracy of an automated data capture and error-checking system for laboratory fish processing. N. American J. Fish. Manage. 14: 650-655, American Fisheries Society.

Breiman, L., Friedman, J.H., Olshen, R.A. and Stone, C.J. (1984), *Classification and Regression Trees*. Belmont, CA: Wadsworth.

Cusick, J., J. LaFargue, and G. Parkes. 2003. NMFS Small Boat Workshop, Summary Report. March 2003, Seattle WA.

Davis, E.C. 2002. Evaluations of the Digital Observer Project and segmentation algorithms for identifying fish with machine vision. University of Alaska Fairbanks, M.S. project progress report. 104 pp. http://www.cs.uaf.edu/public/observer/DigitalObserverMastersProject.doc.

Gilroy, H. L., T. O. Geernaert, S. M. Kaimmer, G. H. Williams, and R. J. Trumble. 2000. A feasibility study that investigates options for monitoring bycatch of the short-tailed albatross in the Pacific halibut fishery off Alaska. Contract report to the National Marine Fisheries Service, Juneau AK.

FAO. 2002. Traceability of products from fisheries and aquaculture. Committee On Fisheries, Sub-Committee On Fish Trade. Bremen, Germany, 12-16 February 2002. COFI: FT/VIII/2002/7.

FAO. 1998. FAO Technical Guidelines for Responsible Fisheries - Fishing Operations - 1 Suppl. 1 - 1. Vessel Monitoring Systems. Rome.

Harms, J. and G. Sylvia. 2000. The Economics of Cooperative Fishery Research: A Survey of U.S. West Coast Groundfish Industry and Scientists. International Institute of Fisheries Economics and Trade, Oregon State University. http://oregonstate.edu/dept/IIFET/2000/abstracts/harms.html

Karp, W. A., C. S. Rose, J. R. Gauvin, S. K. Gaichas, M. W. Dorn and G. D. Stauffer. 2000. Government-industry cooperative research in the Northeast Pacific. Provisions under the Magnuson-Stevens Fishery Conservation and Management Act and examples from the Gulf of Alaska and the eastern Bering Sea. ICES CM 2000/W: 007.

Little, R.J.A. and Rubin, D.B. (2002), Statistical Analysis with Missing Data. Hoboken, N.J.: Wiley.

McElderry, H. 2003. Sustainable fisheries management using fisheries monitoring. Seafood. 11(6).

McElderry, H., J. Schrader, and J. Illingworth. 2003. The efficacy of video-based electronic monitoring for the halibut longline fishery. Fisheries and Oceans Canada, Research Document 2003/042. http://www.dfo-mpo.gc.ca/CSAS/Csas/English/Research_Years/2003/2003_042_E.htm

MRAG. 2003. Evidential value of VMS position reports. European Commission, Brussels. in press.

MRAG Americas. 2003. Evaluation and Analysis of Current Field Sampling in North Pacific Groundfish Fisheries. Task 1: Biological Sampling Protocols. Report prepared for Alaska Fisheries Science Center, National Marine Fisheries Service, Seattle WA.

Neal, R.M. (1998), Regression and classification using Gaussian process priors. In J.M Bernardo, J.O. Berger, A.P. Dawid and A.F.M. Smith, eds. *Bayesian Statistics 6*, pp. 475-501. Oxford: Oxford University Press.

Scientific Fisheries Systems. 2003. Infrared Imaging of Hawaiian Monk Seals – a feasibility study. Report No.: 02-SFS-17. Anchorage AK.

Trumble, R. J., H. Gilroy, and M. Wade. 1997. Discussion paper for an Alaskan weighmaster program. International Pacific Halibut Commission report to the North Pacific Fishery Management Council, September, 1997.

USCG. 2003. Safety of fishing vessels in the vessel monitoring system (VMS). United States Coast Guard. http://www.navcen.uscg.gov/marcomms/gmdss/vms-4.doc

Walsh, W.A. and Kleiber, P. (2001), Generalized additive model and regression tree analyses of blue shark (*Prionace glauca*) catch rates by the Hawaii-based commercial longline fishery. *Fisheries Research* **53**, 115-131.

Tables

Table 1 Comparison of EM with observer programs: Data Quality Issues (Archipelago Marine Research Ltd.)

Data Quality Issue	EM	Observers
Fishing Location	+++	++
Fishing Depth	++	+++
Time/Date of Fishing	+++	++
Number of Hooks/Traps	+++	++
Catch - Pieces	+++	++
Catch - Disposition	+++	+++
Species Recognition	++	+++
Catch - Species Category	+++	+++
Catch - Weight	-	+++

Table 2 EM species recognition capability (Archipelago Marine Research Ltd.)

Performance	Proportion of the catch and number of species
Excellent (<5% mistakes)	92% of catch; 8 species
Good (<10% mistakes)	97% of catch; 13 species
Poor (>10% mistakes)	3% of catch; 12 species
Unknown	0.6% of catch; 23 species

Table 3 Comparison of EM with observer programs: Programmatic Issues (Archipelago Marine Research Ltd.)

Program Issues	EM	Observers
Technological Complexity	higher	lower
Versatility	lower	higher
Sampling Complexity	lower	higher
24/7 Coverage capability	higher	lower
Providing believable data	lower	higher
Intrusiveness	lower	higher
Cost	lower	higher
Industry "Buy In"	higher	lower
Industry Involvement	higher	lower

Table 4. Management measures and applicable electronic monitoring.

Management measure	Application of electronic monitoring
TAC, harvest guidelines, and allocation	Expansion of electronic reporting by individual processors or vessels, such as current Alaskan SPELR and IFQ requirements, to all catches will increase the accuracy and speed of obtaining the data.
Closed areas and time-area closures	Vessel monitoring systems can determine if vessels enter closed zones, as currently applied in Alaska for Steller sea lion closed areas. Sensors on fishing equipment, such as on winches, can determine if fishing occurs.
Trip limits and trip frequency limits	Electronic reporting, as for TAC above, can quickly and accurately track trip limits. VMS can track the number of trips a vessel makes.
At-sea discards	Diverting catcher-processors discards to motion-compensated (hopper or flow) scales could provide total weight of discards; space requirements and cost may limit applicability. Remote observing with cameras may provide counts by species for discards from pot and longline vessels.
Pre-sorting	Remote observing with cameras as planned for the Pacific whiting fishery.
Bycatch on halibut vessels	Remote observers using camera images linked to fishing gear sensors are currently used aboard halibut longline vessels in Canada to provide counts of hooks and catch (numbers) by species or species group.
Marine mammals and seabirds	Remote observing with cameras can determine if longline fishermen use seabird scaring techniques. Remote observing with cameras may identify and count seabirds and marine mammals brought on board. Comprehensive coverage is unlikely without on-board observers.
Prohibited species and bycatch limits	Remote observing with cameras may identify and count some discards and prohibited fish species using remote observers to process images on land. Weights of bycatch and discards are problematic. Regression models could improve estimates of bycatch and discards from unobserved vessels through comparison with observed vessels.
Size limits and sex restrictions	Determination of these limits is unlikely without on-board observers.
Effort control, permits, endorsements	VMS linked to a list of permits, endorsements, or registrations authorized for a vessel.
Gear size (dimensions, mesh size, hook size or spacing, pot opening)	Use of electronic monitoring is unlikely for these types of measures.
Fishing time (soak or haul time, days at sea)	Bottom contract sensors, sensors on winches can track fishing time. Radio frequency identification (RFID) can track the amount of time gear (e.g., pots) is off the vessel. VMS can track days at sea. Automatic hook counter combined with GPS, camera monitoring, hydraulic sensors, or rotation counters.
Gear prohibitions	Remote observing with cameras may identify basic gear types. Bottom contact sensors can monitor for pelagic trawls.
Gear construction (mesh type, chafing gear, roller/rock hopper, buoys and buoy identification, biodegradable panels, TEDs and BRDs, seabird avoidance devices)	Of these, RFID and other electronic identification can uniquely identify individual gears. Remote observing with cameras may detect some gear construction details and can confirm use of required components.
Limits on amount of gear – pot limits	RFID can identify and count individual pots.

Table 5. Monitoring needs and available technologies for determining weight and species composition of groundfish catch

Monitoring needs	Available technologies	Suitability
Species composition – Groundfish	Video camera – Human review, after the fact (Section 2.1)	Total catch enumeration and identification on longliners, does not require at-sea observers
	Video camera – Human review, after the fact (Section 2.1)	Discards enumeration and identification on pot vessels, does not require at-sea observers
	Video camera – Human review, after the fact (Section 2.1)	Not suitable on trawlers
	Video camera – Automatic identification (Section 2.1.2)	Not suitable, software limitations
	Brailer, corer (in development) (Section 3.5.2)	More representative sample for trawl catcher vessels, requires at-sea observers
Species composition – Protected species	Video camera – Human review, after the fact (Section 2.1)	Enumeration and identification; does not require at-sea observers, but moderate success rate in species ID
	Data collection by crew, with video camera confirmation (Section 2.4)	Incentive for misreporting, does not require at-sea observer
Biological samples	Electronic measuring boards (Section 2.5.2)	Expensive; reduce errors, speed up data collection
	Tablet or hand-held PC (Section 2.5.2)	Expensive; reduce errors, speed up data collection
	GIS (Section 2.5.2)	Independent check of location
	Portable, digital, motion-compensated scales (Section 2.5.2)	Used in AFA/CDQ at-sea processors, expensive for catcher vessels
	Digital readout electronic hanging scale (Section 2.5.2)	Not water proof; not suitable for observer work
	Data collection by trained and certified crew, with video camera confirmation (Section 2.4)	Requires buy-in from fishermen, assurance of quality data for researchers and managers
Total catch weight	Motion-compensated flow scales (Section 2.2.1)	Used on AFA/CDQ trawl catcher processors; not suitable on deck
	Motion-compensated hopper scales (Section 2.2.2)	Potential use on pot or longline catcher processors; not suitable on deck
	Video camera – codend volumetrics (Section 2.3)	Potential, not developed
Bycatch estimates from unobserved vessels	Regression estimation – combine observer data with electronic monitoring of unobserved vessels – rates or absolute (Section 4.6)	Need to monitor suitable attributes that relate to bycatch; estimate vessel-specific or group rates or amounts

Table 6. Monitoring needs and available technologies for determining fishing activities by groundfish vessels

Monitoring needs	Available technologies	Suitability
Vessel position	One-way VMS (Section 3.1.1)	Real time or "batch" reporting
Communication with vessels	Two-way VMS (Section 3.1.2, 3.1.3)	Poll vessels for location, transmit management messages to fleet; more expensive than one-way
Vessel reporting of information	Two-way VMS (Section 3.1.2, 3.1.3)	Transmit catch, sensor, or logbook data, transmit emergency information; volume of data may limit use
Determining fishing activity	Sensors on fishing equipment or engines (Section 3.2)	Available for hydraulics, winch-reel rotation, pyrometer
	Video camera – Human review, after the fact (Section 3.3)	Monitor deck activities to verify fishing, discarding/retention
	Longline hook counter (Section 3.5.6)	Longline vessels, verify setting, count hooks; under development
	Radio Frequency Identification (Section 3.5.5)	Identifying, counting, soak time for pots
	Gear measurement (bottom sensor) (Section 3.5)	Commercial sensor packages, mainly for trawl vessels; expensive for smaller vessels
Data logging, electronic reporting	Electronic logbook (Section 3.4, 5)	Gear/equipment sensors, location, catch, biological data.

Figures

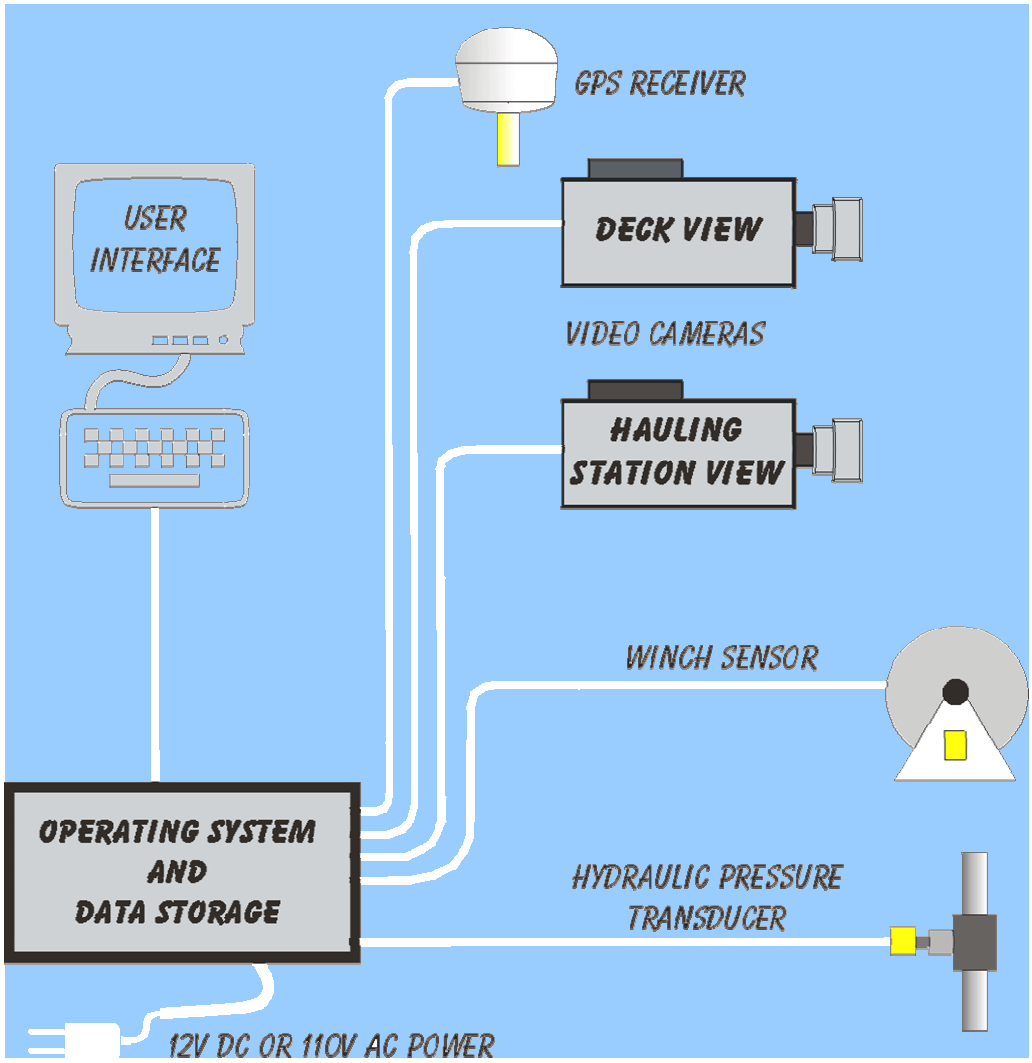

Figure 1 Schematic of a typical electronic monitoring (EM) setup, Archipelago Marine Research Ltd.

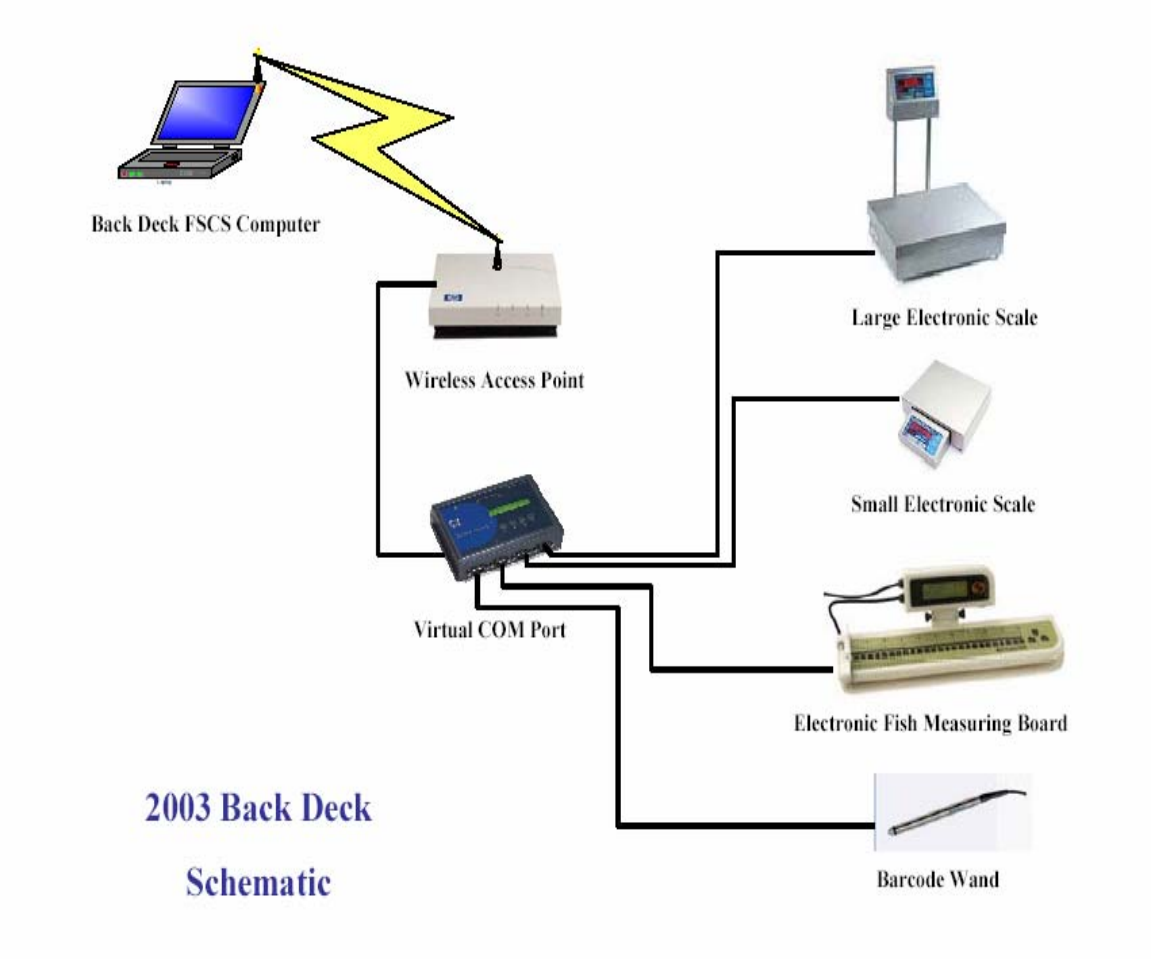

Figure 2 Schematic fish sampling equipment used during 2003 linked to the FSCS (NOAA Fisheries)

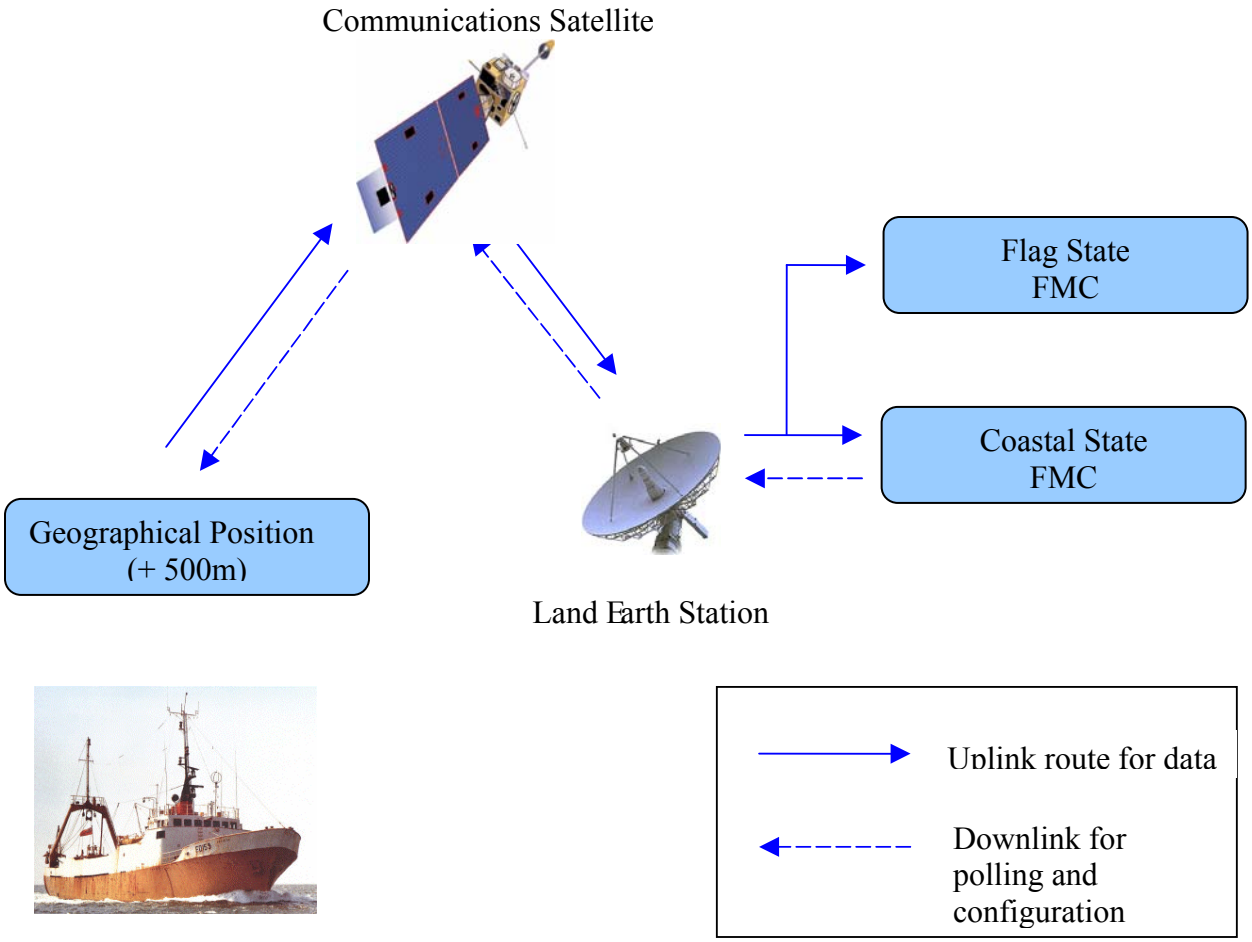

Figure 3 Basic components of a VMS (from MRAG 2003)

Appendix II

Recent correspondence related to observer compensation issues

1. Memo from James Balsiger and Douglas DeMaster to William Hogarth, February 4, 2005
2. Letter from William Hogarth to Chris Oliver, September 17, 2004
3. Letter from William Hogarth to Chris Oliver, June 4, 2004
4. Letter from James Balsiger to Stephanie Madsen, March 24, 2004
5. Letter from William Hogarth to Chris Oliver, March 8, 2004
6. Letter from Chris Oliver to William Hogarth, February 11, 2004
7. Memo from William Hogarth to Terry Lee, November 13, 2003

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Agenda B-1
Supplemental
February 2005

February 4, 2005

MEMORANDUM FOR: William T. Hogarth, PhD
Assistant Administrator for Fisheries

FROM: For James W. Balsiger
Regional Administrator

For Douglas P. DeMaster
Science and Research Director, Alaska Region

SUBJECT: Status of North Pacific Groundfish Observers under the Fair Labor Standards Act (FLSA)

We are requesting your concurrence in our determination that North Pacific Groundfish Observers should be classified as professionals under the FLSA. This determination properly recognizes the professional nature of the work conducted by these observers and resolves some outstanding issues which make it difficult for the North Pacific Fishery Management Council (Council) to restructure the North Pacific Groundfish Observer Program (NPGOP). Incorporating accurate estimates of observer labor rates is important for restructuring alternatives for consideration by the Council. This cannot be achieved while the FLSA status of North Pacific Groundfish Observers remains uncertain.

The National Observer Program Advisory Team (NOPAT) discussed the status of contracted observers under FSLA and the Service Contract Act (SCA) at its October, 2001 and February, 2002 meetings. Positions can be classified as "technical" or "professional" under FLSA. This classification determination can have substantial consequences with respect to remuneration of observers, costs to those who employ observers or contract for observer services, benefits, and other factors. The applicability of SCA to fisheries observers was of particular concern to NOPAT, because SCA provisions place wage rate, overtime, and benefit requirements on employers. The SCA is applicable only to contracted employees whose work is classified as technical. Furthermore, the SCA applies only to employees who are employed to perform services by companies who contract directly with the Federal government to provide those services.

NPGOP observers are not contracted directly by NOAA Fisheries. Rather, they are employed by private companies who contract with fishing companies to provide observer services. Prior to the October 2001 NOPAT meeting, the Department of Labor (DOL) provided an oral determination that the SCA did not apply to NPGOP observers. This

determination was verified in a letter sent to Ms. Victoria Cornish of NOAA Fisheries by Mr. Timothy J. Helm of DOL in June 2003.

In comparison, NPGOP observers' duties are different, more complex, and demanding than the duties of observers deployed in other regions by NOAA Fisheries. Education and training requirements for NPGOP observers are the most comprehensive in the nation. Their responsibilities cover a broad range of requirements for scientific information, inseason target and bycatch quota management, compliance monitoring, and catch accounting to support privileged access to harvesting or processing operations, e.g., IFQ or coops allocation. More detailed position descriptions can be provided upon request.

The minutes of the February 2002 NOPAT meeting indicate that NPGOP observers were not included in the technician classification decision:

> The position descriptions should focus on the duties and responsibilities of fisheries observers as technicians. There may be observers working on a professional level [i.e., NPGOP observers], but these would not be included in the DOL catalog since they are exempt from the Service Contract Act.

Your correspondence with Terry Hart Lee of DOC GC (December 2003) indicated that NOAA Fisheries had made the determination that observers should be considered as technicians under the FLSA. We ask that this correspondence be reviewed and that it be pointed out to Ms. Lee that this determination did not apply to NPGOP observers.

At its December 2004 meeting, the North Pacific Fishery Management Council (Council) discussed potential future changes to the NPGOP. Testimony provided during this discussion included a request that NOAA Fisheries consider classifying North Pacific Groundfish Observers as professionals under FLSA. Even though the Council did not take formal action to request this determination, it broadly supported this position during discussion.

The Council is planning to conduct an initial review of alternatives for reconstruction of NPGOP at its June 2005 meeting. We ask, therefore, that this request for concurrence be considered as soon as possible with the goal of completing the determination by early May 2005.

Staff at the NMFS Alaska Regional Office (Sue Salveson, 907-586-7775) and the Alaska Fisheries Science Center (Bill Karp, 206-526-4194) are available to provide input and assistance during this process.

cc: Chris Oliver, NPFMC

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

SEP 17 2004

Mr. Chris Oliver
Executive Director
North Pacific Fishery Management Council
605 West 4th Street
Anchorage, Alaska 99501-2252

Dear Chris:

This is in response to your letter sent earlier this year, seeking responses to several questions concerning the National Marine Fisheries Service (NMFS) policies regarding observer remuneration and eligibility for overtime, and applicability of certain provisions of the Fair Labor Standards Act (FLSA) to observers and observer providers.

After consultation with the Department of Commerce General Counsel (DOC GC) and the Department of Labor (DOL), it has been determined that NMFS has limited responsibility with respect to observer remuneration. The agency was acting within this limited scope of responsibility when we put forth our position, based on long-standing practices within the Department of Commerce, that observers are technicians and therefore eligible for overtime pay under the FLSA (see my enclosed memo of November 13, 2003). However, the questions you raised regarding how observers are to be compensated to ensure compliance with the requirements of the Service Contract Act (SCA), FLSA, or other Acts, are more appropriately addressed by DOL.

The DOL is the primary Federal agency responsible for enforcing the FLSA, which sets basic minimum wage and overtime pay standards. These standards are enforced by the Department's Wage and Hour Division, a program of the Employment Standards Administration. In addition, the Department of Labor enforces the provisions of two other statutory requirements that affect observer remuneration and overtime pay. They are:

- The McNamara-O'Hara SCA, which requires payment of prevailing wage rates and fringe benefits to service employees employed on contracts to provide services to the federal government, and

- The Contract Work Hours and Safety Standards Act, which requires contractors and subcontractors on federal contracts to pay laborers and mechanics (including other non-professional, non-seamen, non-clerical, or non-supervisory workers) at least one and one-half times their basic rate of pay for all hours worked over 40 in a workweek.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

When NMFS requests proposals for observer services, the work statement generally includes a requirement that all bidders demonstrate how observers will be compensated in accordance with the requirements of the SCA and FLSA, including payment for overtime. The actual enforcement of the SCA and FLSA, with respect to record-keeping and computation of pay and benefits, is the responsibility of DOL. Unfortunately, a simple read of the DOL regulations regarding SCA and FLSA wage computations does not relate directly to the circumstances of fishery observers whose tour of duty may exceed 24 hours. Therefore, NMFS recognizes that further guidance may be useful regarding the requirements of the SCA and FLSA as they pertain to fishery observers on extended tours.

In response to our recent inquiries regarding applicability of the SCA and FLSA to observer wages, the DOL Wage and Hour Division has offered to provide training and guidance to NOAA contracting officers, observer providers, and other interested parties as appropriate on the SCA and FLSA. Information from these sessions will be summarized and made available on a public website.

The NOAA Acquisitions and Grants Office (AGO) will be working with DOL's Wage and Hour Division to arrange the most suitable date(s) and venue(s) for such training. The questions you have raised will be provided to DOL to ensure that they are addressed during the training, and NOAA AGO will notify you when training sessions have been scheduled. It is my hope that this approach will provide the Council with sufficient information to conclude its evaluation of regulatory alternatives associated with restructuring of the North Pacific Groundfish Observer Program.

Sincerely,

Bill

William T. Hogarth, Ph.D.
Assistant Administrator for Fisheries

Enclosure

cc: Helen Hurcombe, NOAA Acquisitions and Grants Office
Kim Dietrich, Association for Professional Observers
Joseph Sullivan, Mundt MacGregor

bcc: DOCGC CLD (Lee), DOCGC ELLD (Fields-Jones), GCF (Sathre), AKR (Salveson), AFSC (Karp), GCAK (Meyer), PIRO (Kelly), SWR (Petersen), NEFSC (Potter), SEFSC (Nance), NWFSC (Cusick), ST4 (Cornish)

Appendix II - FLSA memos

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

NOV 1 3 2003

MEMORANDUM FOR: Terry H. Lee
Office of General Counsel

FROM: for William T. Hogarth, Ph.D.

SUBJECT: Applicability of Overtime Pay for Fisheries Observers

This memo supplements a request from Mr. Abe Vinikoor of the Western Administrative Support Center (WASC) for an legal opinion from the Department of Commerce Office of General Counsel (DOC OGC) on whether contracted fisheries observers are entitled to overtime pay. It provides justification for the National Marine Fisheries Service (NMFS) position that contracted fisheries observers are non-exempt from coverage under the Fair Labor Standards Act and other Acts, as appropriate, by virtue of their status as technicians, and therefore are eligible for overtime pay.

Based on information provided by DOC OGC and Department of Labor representatives during a workshop sponsored by the NMFS' National Observer Program (see Appendix 1; Fisheries Observers Insurance, Liability, and Labor Workshop, section 4.2, pp. 17-20), it was determined that NMFS needed to clarify the status of observers as either professionals (which are exempt from coverage under the Fair Labor Standards Act), or technicians (which are non-exempt).

This issue was discussed at a subsequent meeting of the National Observer Program Advisory Team. The National Observer Program Advisory Team is comprised of representatives from each NMFS region and headquarters office. The Advisory Team works with NMFS' National Observer Program staff in the Office of Science and Technology to identify issues of national concern, to recommend or establish priorities for national research and problem solving, and to support information collection and program implementation. The team, at its October 2001 meeting, recommended that the National Observer Program develop a Position Description for fisheries observers that would clarify their status as technicians, using the Biological Technician series (GS-404) as a starting point. It was recommended this Position Description be forwarded to the Department of Labor for consideration in issuing future Wage Rate Determinations and for inclusion in the Service Contract Act Directory of Occupations (see http://www.dol.gov/esa/regs/compliance/whd/wage/main.htm). This clarification would provide consistency in wages paid to observers in various regions of the U.S. In addition, it would help clarify pay scales for work performed on land and at sea and aid in determining appropriate types of benefits, i.e., overtime compensation.

The National Observer Program, in consultation with the National Observer Program Advisory Team, reviewed the duties and responsibilities of fisheries observers and developed a classification scheme identifying three levels of Fishery Observer for consideration by the

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Department of Labor (Level I/II/III). I sent a letter to Mr. William Gross, Director of the Department of Labor's Wage Determination Division on September 9, 2002 (see Appendix 3) to that effect. That letter, along with a subsequent letter dated November 6, 2002, resolved to establish wage rates for contracted fisheries observers that are comparable to Federal Observers under the General Schedule (GS) system.

The development of Fishery Observer Position Descriptions for consideration by the Department of Labor was prompted by inconsistencies in wage rate determinations that had been made up to that point, and the fact that these wages were considerably less than the federal equivalency for the same type of position. Wage rate determinations issued by the Department of Labor for various localities stipulated minimum hourly wages ranging from $9.55/hour (2001 for California, Oregon, Washington) to $10.59/hour (2001 for California County of Los Angeles), whereas the 2003 hourly pay scale for GS-5 employees is $11.23/hour (see http://www.opm.gov/oca/03tables/pdf/gs_h.pdf). If the Department of Labor had a uniform national standard for making wage rate determinations for fisheries observers, then there would be more consistency in wage rates for contracted observers, and these wages would reflect wages that would be paid to federal employees performing the same job functions.

In developing the position that contracted fisheries observers are technicians, the National Observer Program, in consultation with the National Observer Program Advisory Team, considered both the duties and responsibilities of fisheries observers as well as past recruitment actions for Federal fisheries observers (see Appendix 4). In a 1999 Vacancy Announcement for Federally-employed fisheries observers in Hawaii that was issued before the program was converted to a contracted program, recruitment for fisheries observers were for Biological Science Technicians (ZT-404-II, equivalent to GS-5 through GS-8).

The classification of fisheries observers as technicians is also consistent with guidance from the Office of Personnel Management's classification standards for (see The Classifier's Handbook, Chapter 4 "Determining the Pay System and Series" at http://www.opm.gov/fedclass/clashnbk.pdf). The duties and responsibilities of fisheries observers involve adhering to routine sampling protocols that are planned and managed by professional employees. Fisheries observers perform these duties unsupervised, but all work is carefully reviewed for completeness and accuracy by professional biologists. Although most of the contracted observer programs currently require that observers have a professional degree (usually a Bachelor's degree in a biological science) as an eligibility standard for recruitment by the contracted observer service provider, specialized experience can be substituted for education (see also Appendix 4, Qualifications). Observers then receive up to three weeks of specialized training, which must be completed to the satisfaction of the program before observers are certified to be deployed aboard fishing vessels.

Therefore, NMFS maintains the position that fisheries observers are biological technicians and are therefore eligible for overtime compensation under the Service Contract Act (SCA), the Fair Labor Standards Act (FLSA), and other Acts stipulating wages and benefits for contracted service employees, as appropriate.

While we understand that work performed by observers beyond U.S. territorial waters is outside of the jurisdiction of the SCA and FLSA, attempting to track the geographical location of a vessel in order to determine whether or not SCA/FLSA wages apply would be a huge administrative burden for both the contracted observer provider and the agency. Therefore, it is the position of NMFS that the wage rate that the Department of Labor determines is appropriate for each specific locality should be applied to contracted fisheries observers whether they are working inside or outside of U.S. territorial waters in order to provide a fair, simple, and consistent application of the SCA/FLSA.

If you concur with this position, we strongly encourage you to advise WASC to request a revised Wage Rate Determination from the Department of Labor for Honolulu, as well as for localities that may be associated with the deployment of observers under current West Coast observer contracts as well as those solicited in the future. This would apply to contracts, cooperative agreements, and grants issued for the deployment of observers in the Alaska Marine Mammal Observer Program, the West Coast Groundfish Observer Program (via a cooperative agreement with the Pacific States Marine Fisheries Commission), and the California Longline and Gillnet Observer Programs. This will ensure that wage rates for fisheries observers reflect the new Position Descriptions for Fishery Observers that were provided to the Department of Labor in 2002, and that overtime pay is provided under these contracts in accordance with the SCA, FLSA, or other applicable laws.

Attachments

Appendix 1.

Excerpt from the Final Report of the Fisheries Observers Insurance, Liability, and Labor Workshop, June 12-14, 2001 (Section 4.2, pp. 17-20)

Appendix II - FLSA memos

ɔmetimes find themselves having to assist ıshermen with the fishing operation. If an injury occurred to an observer while they were taking part in the fishing operation, the policy would be nullified.

Furthermore, in many regions, vessels do not have P&I insurance. This is more common with small vessels, especially those operating in the Gulf of Mexico and Alaska.

Q: How does compensation under the Jones Act work?

Under the Jones Act, if a vessel is considered negligent, the injured seaman can sue for compensation. If awarded by the court, compensation may be provided beyond the "maintenance and cure" typically provided by employers (or their insurers). Compensation is paid retroactively from the time of injury forward. In lieu of this compensation or until an award is made, maintenance is provided to cover food and other incidental expenses (typically at no more than a modest $26/day, based on average maintenance costs while at sea). Wages are also paid, but only from the point of injury to home. Transportation costs are also limited to getting the injured individual home. Hence, Jones Act remedy is not all that attractive until a case gets to the litigation stage and only then if a jury agrees that the plaintiff deserves a lot more compensation.

4.2 Applicability of the Service Contract Act, Contract Work Hours and Safety Standards Act, and the Fair Labor Standards Act to observers as they pertain to pay for hours worked beyond 40 hours per week

Supplemental meeting materials may be found In Appendix B, Appendix C, Appendix D, and Appendix E.

Tom Obert, *Department of Labor*
Wage and Hour Division
Washington, D. C.

In 1965, the Service Contract Act (SCA) was established to set standards for wage rates and to fill gaps that existed in government contracts. Because the principle cost in service contracts is wages of staff working on the contract, there was concern that competitive bidding and ⁻ward of contracts to the lowest bidders ɔuld cause wage rates to decrease below acceptable levels. The SCA was intended to remedy this problem.

Observer programs generally contract for services through the use of service employees and are therefore subject to the SCA. Generally, only professional or administrative employees are exempt from the SCA. The definitions of professional and administrative employees are found in the Fair Labor Standards Act (FLSA) and are how FLSA links with the SCA. Exempt employees are those that are salaried, do not receive overtime pay, and are required to have at least a bachelor's degree to conduct the specific work for which they are employed. Non-exempt employees have hourly wage rates set, and are paid overtime for hours worked over a 40 hour workweek. The

Act itself does not define who these employees are; these are defined in CFR 29 Part 541. The SCA also does not address overtime directly; this is covered by FLSA or by the Contract Work Hours and Safety Standards Act (CWHSSA).

Although the CWHSSA deals with overtime compensation, it is limited to laborers and mechanics and thus does not figure prominently in work performed by observers. In addition, it is unclear whether CWHSSA has the same geographical limits as FLSA, for example, if a vessel departed a port in US waters and steamed beyond US Territorial Waters, but returned within 40 hours, the vessel would be covered by FLSA, but it may not be covered under CWHSSA.

Observers are paid wages that are based on an hourly rate and are clearly service employees, thus, they are covered by the SCA. However, because the FLSA does not apply beyond the U.S. territorial waters (12 miles from shore), and some observers work beyond this point, there may be periods when observers are exempt from the SCA. Technically, observers (and their employers) are only subject to these laws for that portion of work performed inside territorial waters. This makes the application of the requirement to pay overtime more confusing.

> *"For the most part, observers are working in international waters, beyond the scope of the U.S. You're not going to have either SCA or FLSA coverage during that time at sea."*
> *T. Obert*

Mark Langstein, *Department of Commerce, General Counsel*
Contract Law Division
Washington, D.C.

As described by Mr. Obert, the Contract Work Hours and Safety Standards Act provides guidance for overtime compensation, but would generally not apply to observers because their tasks and functions are considered technical and scientific, not manual labor. However, observer programs would have to be assessed on an individual program by program basis to determine whether the Contract Work Hours and Safety Standards Act would apply in specific cases. Based on existing programs, it is likely that observers would be considered professional employees and not manual laborers and therefore the Act would not apply. For example, taking biological samples, other measurements, and maintaining records would not be considered manual labor, even if the work were physically demanding at times. Additionally, a minimum of a Bachelor's degree or other special training is usually required to be an observer.

Discussion and Q&A session

Q: What is the definition of salary?

Salary is basically a set amount employees receive regardless of the number of hours worked over a specified amount of time. The Department of labor (DOL) normally issues wage determinations under the SCA. In a collective bargaining agreement, DOL is obligated to issue a wage rate and fringe benefits and a daily rate may be negotiated. However, it is

not clear whether a daily rate constitutes a salary for the purposes of the FLSA.

It was the understanding of some panelists and participants that observers would not be exempt from the provisions of the SCA and FLSA. The CWHSSA provides the ability to apply liquidation standards, which allows the US Government to recover dollars if overtime was not properly paid to employees, but the SCA does not. Hours worked are defined in 29 CFR 785.6.

Q: What is the area covered by the Outer Continental Shelf Act as it relates to territorial waters and overtime?

With regard to distance from shore, the area covered by the Outer Continental Shelf Act was based on the distance and depths at which offshore drilling used to occur (out to 100 fathom contour, or a depth of approximately 600 feet). This is likely to be the same basis as for the SCA and FLSA as to why they do not cover employees outside of Territorial waters.

Q: If observers are considered biological technicians, what effects does the FLSA or CWHSSA have on them?

They would be non-exempt under the SCA, but then a determination remains regarding which overtime law applies, the FLSA or CWHSSA. The CWHSSA only applies to labourers and mechanics, whereas the FLSA applies to everyone else. If observers are paid hourly and considered non-exempt for purposes of overtime laws, the FLSA or CWHSSA requires that they be paid time and one half for overtime. But confusion obviously exists, and the application of these standards is currently inconsistent. In the Southeast US, one NOAA Fisheries observer program considers observers exempt, and pays a daily rate or salary, not an hourly wage. Another NOAA Fisheries observer program does not consider observers exempt and pays an hourly wage plus overtime.

Q: How are "Agreements" viewed by DOL?

While the SCA deals only with contracts, for the purposes of this Act, all "agreements," even those lacking a clear contract, are considered to have the "intent" of a contract, thus making the Act applicable.

Q: Who sets the wage determinations?

Although the Department of Labor issues wage rate determinations, NOAA Fisheries or their contractors provide the information used to make those determinations. Currently, NOAA Fisheries has seven wage rate determinations for fisheries observers operating in various parts of the country, each with a different wage rate.

Generally, federal observers have been hired at a rate equivalent to GS-5, Step 1. However, the current wage determination rate for some observers is more in line with a GS-3 rate. It was unclear to the observer program managers whether this determination was based on information provided to the Department of Labor by NOAA Fisheries, or from some other source. However, anyone can request a review and re-consideration of a wage rate. If the practice of a federal direct hire for a GS-5 was to include hazardous pay,

then this must be taken into account in the equivalent observer wage rate determinations issued by DOL.

Q: What is the penalty for an agency not going to the Department of Labor and asking for a wage determination?

There is no particular penalty, however, if it comes to the attention of the Department of Labor, then they send a letter to the agency to rectify the problem, retroactively. Employees do not have private right of action under the SCA. DOL has sole enforcement authority and is mandated by statute to act on the employees' behalf. Under the FLSA, an employee can sue their employer for inappropriate wages, but they cannot sue under the SCA. However, in the event of an injury, different laws and different rules apply.

Q: Are there processes set up for dealing with cumbersome circumstances, for instance, locality keeps changing or employees keep moving around?

If the nature of the job is such that employees work from different locales, the Department of Labor uses head-up points, which refers to where the trip began. Multiple landings do not negate the SCA requirements.

Q: What is the applicability of the SCA to observers in the North Pacific groundfish observer program, considering its unique service delivery model?

There have been two rulings (by different agencies) regarding the applicability of the SCA to observers employed by private companies supplying observers for the North Pacific Groundfish Observer Program (NPGOP). One, by NOAA Fisheries, determined that the SCA did apply. The other, by the Department of Labor, determined it did not apply.

In the NPGOP, even though there is not a direct contract between NOAA Fisheries and the private companies or service providers that employ the observers, NOAA Fisheries has presumed that the situation met the intent of an "agreement" between the two parties and therefore fell under SCA requirements. NOAA Fisheries has therefore been requiring the observer service providers to meet the requirements of the SCA. However, it was the position of the General Counsel of the Department of Labor that under the NPGOP there was not a contract, therefore the SCA was not applicable.

The Department of Labor has final authority on labor issues. These kinds of questions should go to Labor for the appropriate expertise.

If observer companies in the NPGOP are required to pay SCA wages, but do not, the Department of Labor could issue a three-year debarment. There is no avenue for early removal of this debarment period once it is in place. During an investigation, if a contract was found out to have a wage rate, a determination would be made and the investigation would resume.

It was noted that, observers in the NPGOP worked outside of Territorial Waters most of the time, where the SCA or the FLSA does not appear to apply.

Appendix 2.

Excerpt from the minutes of the October 2001 meeting of the National Observer Program Advisory Team.

Topic: Observer Roles, Duties & Responsibilities

A better definition could help address the following:

- Determining pay for observer work performed on land and at sea
- Determining appropriate types of benefits
- Obtaining appropriate Department of Labor Wage Rate Determinations
- Defining the status of observers under FECA
- Establishing hiring standard guidelines for observer contractors

There was discussion as to whether observers were in the technical vs. professional series, and there was agreement that beginning observers were technicians, even though increasing job responsibilities may make them eligible for professional series positions down the road. There was clarification that even though observers are exposed to hazardous conditions, which may make them eligible for hazardous duty pay, this does not change their basic job duties. Job descriptions should also include compliance monitoring responsibilities where appropriate. It was noted that there is currently a lack of consistency between regions with respect to how observers are paid, i.e., and what constitutes a work day.

Observer Definition - It was agreed that:

- A new position description for observers should be developed using the Biological Technician position as a starting point. The name should be something like "Marine Resources Observer."

This new Position Description could be used by NMFS to:

- Request revision of current DOL Wage Rate Determinations
- Define observers for purposes of FECA compensation (which may require references to the various Service Delivery Models). This may require considerable discussions and further analysis under the Risk Management Plan.
- Develop recruitment guidelines for observer service providers
- Amend federal job Position Description library to include "Marine Resources Observer."

Appendix II - FLSA memos

Appendix 3.

Letter from Dr. William Hogarth, National Marine Fisheries Service, to Mr. William Gross, Department of Labor Wage Determination Division, regarding Position Descriptions for Fishery Observers (September 9, 2002),

and

Subsequent letter to Ms. Sandra W. Hamlett, Department of Labor Employment Standards Administration, clarifying Federal GS equivalencies for Fishery Observers (November 6, 2002).

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

SEP - 9 2002

Mr. William Gross
Director, Wage Determinations Division
U.S. Department of Labor
Frances Perkins Building
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. Gross:

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) is submitting the enclosed multi-level position descriptions for use by the Department of Labor (DOL), Wage and Hour Division in determining wage rates for contracted fisheries observers. NOAA Fisheries drafted these descriptions clearly defining fisheries observer duties and responsibilities with the intent that they would be incorporated in the DOL's catalog of job categories.

Our regional observer programs are resolved to establishing wage rates for contracted fisheries observers that are comparable to Federal observers under the General Schedule (GS) system. Therefore, to assist DOL in establishing appropriate wage rates for fisheries observers, we are also providing equivalent federal wage rates for similar positions. Entry level wage rates for federally hired fisheries observers (analogous to the Fisheries Observer Level I position description enclosed) have historically been based on a GS-5 step-1 hourly rate. Once incorporated, these descriptions should ensure that wage rate determinations for contracted fisheries observers are rendered from a uniform national standard.

I appreciate your attention to this request. Please contact Dennis Hansford in the Office of Science and Technology at 301-713-2328, ext. 217 regarding actions taken by DOL in addressing this request.

Sincerely,

William T. Hogarth, Ph.D.

Enclosures

cc: F/ST, F/ST1, F/ST1:DHansford:VCornish, GCF, F/CU(2)
NMFS:F/ST1:DHansford:713-2328:ddh:9/4/02
Revised By:DHogans:9/6/02

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

FISHERY OBSERVER I

Performs routine tasks associated with recurring and continuing work according to prescribed or established procedural standards and technical methods assigned. Assures that tasks are completed, data developed, methods used in securing and verifying data are technically accurate and in compliance with instructions and established procedures. Makes estimates of amounts and species composition of fish caught, retained and discarded, using at a minimum, simple, single stage sampling techniques and dichotomous keys. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. According to established standards and detailed procedures, records data on appropriate forms and logs, some of which may be electronic. Maintains field equipment and supplies. Collects scientific, management, compliance information, and make observations of fishing operations. Use and complete a pre-boarding vessel safety checklist. Measures selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. May tag species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Uses calculator and/or PC for calculations and recording data. Obtains, enter and transfer data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. May use interpersonal and communication skills to contact fishermen and schedule observer sampling trips. May observe and document compliance with fishery regulations, and may write affidavits. May camp at remote sites and may operate All Terrain Vehicles (ATV's) and skiffs.

FISHERY OBSERVER II

Independently executes duties, while learning when and how to resolve exceptions and special problems or to make adaptations in the procedures. Makes estimates of amounts and species composition of fish caught, retained and discarded, utilizing knowledge of various statistically valid sampling methods and dichotomous keys. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. According to established standards and detailed

procedures, records data on appropriate forms and logs, some of which may be electronic. Supplies in-season reports. Maintains field equipment and supplies. Use and complete a pre-boarding vessel safety checklist. Collects scientific, management, compliance information, observations of fishing operations, measure selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. Participates in tagging species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Uses calculator and/or PC for calculations and recording data. May enter and transfer data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. Uses knowledge of interpersonal and communication skills while contacting fishermen to schedule observer sampling trips and may coordinate observer activities with appropriate State agencies. May observe and document compliance with fishery regulations, and may write affidavits. May camp at remote sites and may operate All Terrain Vehicles (ATV's) and skiffs. May participate in aerial surveys and surveys to provide abundance data or describe fisheries to be used in observer data analysis and program design.

FISHERY OBSERVER III

Acts as field coordinator and primary debriefer of lower graded Fishery Observers. Oversees and tracks debriefing lower graded Fishery Observers, final data review, data editing and entry. Demonstrates extensive familiarity of methods, procedures and management to ensure proper day-to-day operations. Shifts from one type of responsible technical assignment to other types, which are different in terms of equipment used, of data used, and uses to which data will be put. Acts as primary field contact to address sampling, data, and deployment issues. Makes recommendations so as to increase the efficiency of recruiting, training, and safety components of the program. Supplies in-season reports. Independently executes duties, while learning when and how to resolve exceptions and special problems or to make adaptations in the procedures. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. Makes estimates of amounts and

species composition of fish caught, retained and discarded, utilizing knowledge of various statistically valid sampling and sub-sampling methods and dichotomous keys. According to established standards and detailed procedures, records data on appropriate forms and logs, some of which may be electronic and provide recommendations for updates. Oversees the maintenance of field equipment and supplies. Use and complete a pre-boarding vessel safety checklist. Collect scientific, management, compliance information, observations of fishing operations, measure selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. Participates in tagging species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Use calculator and/or PC for calculations and recording data. Enters and transfers data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. Uses knowledge of interpersonal and communication skills while contacting fishermen to schedule observer sampling trips and coordinate observer activities with appropriate State agencies. Observes and documents compliance with fishery regulations, and write affidavits as required. Camps at remote sites and operates All Terrain Vehicles (ATV's) and skiffs as required. Participate in aerial surveys and vessel surveys to provide abundance data or describe fisheries to be used in observer data analysis and program design.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, MD 20910

THE DIRECTOR

NOV - 6 2002

Ms. Sandra W. Hamlett
U.S. Department of Labor
Employment Standards Administration
Wage and Hour Division
Washington, D.C. 20210

Dear Ms. Hamlett:

This is in response to your letter regarding the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) Observer Position Descriptions. Your letter requested Federal Grade Equivalencies for the three levels of Fishery Observer positions that NOAA Fisheries submitted for inclusion in the Department of Labor's Service Contract Directory of Occupations.

The Federal Grade Equivalencies for the three Fishery Observer positions are as follows:

- Fishery Observer I = GS-5 step 1
- Fishery Observer II = GS-6 step 1
- Fishery Observer III = GS-7 step 1

If you require any additional assistance in this matter, please contact Dennis Hansford at 301-713-2328, Ext. 217.

Sincerely,

William T. Hogarth, Ph.D.

cc: F/ST:F/CU:F/ST1:F/ST1:DHansford:Cornish
Drafted by:DHanfords:713-2328:11/5/02:a:GSequiv.forDOL.wp

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Appendix II - FLSA memos

Attachment 4.

Vacancy Announcement for Fisheries Observers in Honolulu, Hawaii (July 1999)

U. S. Department of Commerce

VACANCY ANNOUNCEMENT

National Oceanic & Atmospheric Administration (NOAA)

Opening Date:	07/23/99
Closing Date:	08/23/99
Position Title:	Biological Science Technician (Fisheries)
Series & Grade:	ZT-0404-II (equivalent to GS-05 through GS-08)
Duty Station:	Honolulu, HI
Vacancy Number:	W/NMF/SWR/99~~0000~~0475.LN
Organization:	National Marine Fisheries Service (NMFS) Southwest Region (SWR) Pacific Islands Area Office
Area of Consideration:	Any U.S. citizen
Work Schedule:	Full-Time Seasonal
Type of Appointment:	Term Appt NTE Fifteen Months and may be extended without further competition
Number of Vacancies:	Twelve
Service:	Competitive
Salary Range:	Annual: $20,588 to $36,711 Hourly: $9.86 to $17.59 (plus a 25% cost of living allowance) **Starting salaries may be set anywhere within the pay range of a pay band.**

Notes: DOC applicants may be considered before all others. Payment for relocation expenses is not authorized. All status applicants who wish to be considered under both Merit Assignment Plan (MAP) as well as Agency-Based (AB) procedures must submit two complete applications. When only one application is received, qualified status candidates will be considered under MAP only and qualified nonstatus applicants will be referred under AB procedures. If in doubt as to which category applies to you, submit two applications. Work is expected to last more than 6 months but less than 11 months per year. Qualified individuals with ocean experience aboard small boats are especially encouraged to apply. Selectees must be able to pass a preemployment physical examination administered by the NMFS in Honolulu, HI or Long Beach, CA. Work is full-time, however it may be interrupted by short periods of nonpay status due to lack of fishery activity.

Duties: Sea-going observers work 40 or more hours per week as the only government employee aboard privately-owned commercial fishing vessels. The observers collect needed information to assess the incidental involvement of protected species in the Hawaii longline fishery, including data on fishing effort and animal life history.

Supplemental Information:

Training: Begins upon appointment and continues for 3 weeks. Trainees must satisfactorily complete written tests with an overall average score of 85% or greater, demonstrate their potential to collect accurate field data, and

exercise their astuteness and reaction to unfamiliar situations at sea in a professional manner in order to qualify for sea assignments. Failure to meet these criteria will result in termination of employment.

Cruises: Vessels operate from Hawaiian ports on the islands of Oahu and Hawaii. Observers travel by public transportation to meet their assigned vessels, and are expected to remain with their assignments until the fishing trips end. Typically, trips are 2 to 6 weeks in duration. Vessels operate in the open ocean in all weather and sea conditions.

Vessel Description and Accommodations: The commercial fishing vessels are small, generally from 50 to 110 feet in length. Crew members and observers live and sleep in cramped quarters, often in damp conditions, and share common toilet facilities. The majority of vessels have no showers, and many lack permanent toilets. Although vessels do not have separate facilities for women, federal law requires reasonable privacy. Observers work at sea aboard some vessels where the crew does not speak English and serve exclusively ethnic food such as rice and raw or dried fish. Because of the small size of these vessels and their response to sea conditions, motion sickness can be debilitating for some individuals and should be seriously considered by all applicants.

Mandatory Nonduty/Nonpay: During times of low levels of fishing activity, and when vessel assignments are unavailable, observers are placed in nonduty/ nonpay status. They may be placed, although rarely, in nonpay status for up to 3 months per year.

Other Conditions:

- Vessels carry no trained medical personnel aboard and rely upon the first aid knowledge of the operators and crews.
- Observers must be capable of moving animal carcasses up to 200 pounds each and have clear distant vision (correctable to 20/20 in one eye and to 20/40 in the other) for observing marine animals in the wild.
- Psychological stress may be potentially high since the observer is the sole government employee living in confined quarters with commercial fishermen whose work may conflict with observer duties.
- Observers do not choose vessel assignments. Vessel suitability is determined by the U.S. Coast Guard and management. Management selects sea assignments through a predetermined sampling plan and confirms that the boats meet U.S. Coast Guard safety requirements. Fishing activity dictates vessel departures and arrivals. Since vessel notification requirements limit response time, observers must be prepared for sudden sea assignments of extended and uncertain duration. Refusing assignments may be grounds for dismissal.
- When at sea, observers work in a self-supervised capacity, and receive premium pay above their base salary.

Qualifications: A minimum of 1 year of specialized experience at least equivalent in difficulty and responsibility to the next lower grade/band level in the federal service is required. Specialized experience must have been in the field of fisheries and included ~~functions such as:~~ (a) observing ocean surroundings and vessel operations during harsh ocean conditions; (b) recording data on protected species observations and fishing operations; (c) recording sea turtle, seabird, and marine mammal encounters incidental to fishing operations; (d) collecting biological samples from postmortem specimens; and (e) entering data into a data base via computer.

Substitution of Education for Experience: Successful completion of a full 4-year course of study leading to a bachelor's degree with major study or 24 semester hours in any combination of scientific or technical subjects such as biology, chemistry, statistics, entomology, animal husbandry, botany, physics, agriculture or mathematics, of which at least 6 semester hours was directly related to fishery biology, may be substituted for the required experience.

Equivalent combinations of education and experience may also be used to meet the qualification requirements--only education in excess of the first 60 semester hours is creditable toward meeting the specialized experience requirement. Two full academic years of study (60 semester hours) beyond the second year is equivalent to one year of specialized experience.
Quality Ranking Factors (* = critical): (1) * Working knowledge of shipboard collection of biological, oceanographic, and management data; (2) * Ability to live and work in isolated situations under adverse conditions; (3) * Ability to interpret and follow written and verbal instructions for data collection protocols.

APPLICANTS MUST INDIVIDUALLY ADDRESS ALL OF THE ABOVE QUALITY RANKING FACTORS ON A SUPPLEMENTAL SHEET ATTACHED TO THEIR APPLICATIONS. FAILURE TO DO SO MAY RESULT IN NOT BEING REFERRED AMONG THE BEST QUALIFIED FOR THIS VACANCY

Application Address:
WASC/HRD, WC24, BIN C15700
7600 Sand Point Way N.E.
Seattle, WA 98115-0070
Attn: W/NMF/SWR/980000.LN

Internet Information Address:
http://www.rdc.noaa.gov
FAX: (206) 526-6673
TDD: (206) 526-6105

FOR RECORDED SELECTION RESULTS FOR THIS VACANCY AND OTHER EMPLOYMENT INFORMATION, CALL (206) 526-6294. THIS MESSAGE WILL BE UPDATED EVERY OTHER MONDAY AFTERNOON.

IF YOU WANT CONFIRMATION THAT YOUR APPLICATION HAS BEEN RECEIVED, SEND YOUR APPLICATION MATERIALS VIA CERTIFIED MAIL/RETURN RECEIPT REQUESTED OR OTHER FORM OF SELF-NOTIFICATION OF DELIVERY. PLEASE DO NOT CALL THE HUMAN RESOURCES OFFICE ON PHONE NUMBERS OTHER THAN THOSE LISTED ABOVE TO INQUIRE ABOUT THE STATUS OF YOUR APPLICATION.

Demonstration Project: Effective March 29, 1998, these positions converted to the DOC Personnel Management Demonstration Project. This project replaces the federal GS pay plan and structure. Under the project, positions are classified by career path, pay plan, and pay band. The following charts show how each of the 4 career paths correspond to the GS grades:

Career Path	PP	Pay Bands				
Scientific & Engineering	ZP	I	II	III	IV	V
Corresponding	GS	1-6	7-10	11-12	13-14	15
Sci & Engnr Technical	ZT	I	II	III	IV	V
Corresponding	GS	1-4	5-8	9-10	11-12	13
Administrative	ZA	I	II	III	IV	V
Corresponding	GS	1-6	7-10	11-12	13-14	15

General Support	ZS	I	II	III	IV	V
Corresponding	GS	1-2	3-4	5-6	7-8	9-10

Salary increases within pay bands occur through the pay-for-performance system only.

APPLICATION REQUIREMENTS

1. Provide the following information:
   a. The vacancy announcement number, position title, and grade level(s);
   b. Your full name, social security number, day and evening phone numbers, mailing address, country of citizenship, veterans preference, reinstatement eligibility, and highest federal civilian grade ever held on a permanent basis;
   c. The name, city and state of high schools attended and date of diploma or GED;
   d. The name, city and state of colleges/universities attended, majors, type and date of degrees **(IF QUALIFYING BASED ON EDUCATION, PROVIDE COPIES OF ALL COLLEGE TRANSCRIPTS; COMPLETED OPM 1170/17; OR LIST OF COURSES INCLUDING COURSE TITLES, GRADES, DATES COMPLETED, AND SEMESTER/QUARTER HOURS)**;
   e. The job titles, duties and accomplishments, salaries, employers' names and addresses, supervisors' names and phone numbers, starting and ending dates, and hours per week of any paid or non-paid work experience that relates to this vacancy;
   f. A statement as to whether or not we may contact your current supervisor; and
   g. Any job-related training courses, special skills, certificates and licenses, honors, or awards.
2. Use a resume, Optional Application for Federal Employment form (OF-612), Application for Federal Employment (SF-171), or any other written format, and send it to the Application Address.
3. Meet all eligibility and qualification requirements by the closing date.
4. Ensure that the application is postmarked by the closing date and received within the Human Resources office within three work days. Applications transmitted by facsimile machine are acceptable but must be received by the closing date. This agency bears no responsibility for ensuring that our machines are available for receipt of applications or for the quality of the copies. Note: Department of Commerce Career Transition Assistance Program eligibles may apply at any time until a certificate of eligibles is issued.
5. Apply at your own expense. Applications mailed in government postage-paid envelopes will not be accepted. Facsimiles from non-government machines are acceptable.
6. Current permanent (competitive status) applicants and those who have reinstatement eligibility must include a copy of their Notification of Personnel Action (SF-50) reflecting a "1" or "2" in block 24 and a "1" in block 34.

SPECIAL INTEREST INSTRUCTIONS

1. Career Transition Assistance Program (CTAP) and Interagency Career Transition Assistance Program (ICTAP) eligibles:
   a. CTAP eligibles must submit a copy of their specific RIF notice and documentation from their agency reflecting the promotion potential of their most recent federal position;

AGENDA C-7
JUNE 2004
Supplemental
Handout 6/13 11a

UNITED STATES DEPARTMENT OF CO
National Oceanic and Atmospheric Admi
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

RECEIVED
JUN - 4 2004
N.P.F.M.C.

Mr. Chris Oliver
Executive Director
North Pacific Fishery Management Council
605 West 4th Street
Anchorage, Alaska 99501-2252

Dear Mr. Chris Oliver:

Earlier this year, you wrote to me on behalf of the North Pacific Fishery Management Council (Council), seeking responses to several questions concerning the National Marine Fisheries Service's (NMFS) policies regarding observer remuneration and eligibility for overtime, and applicability of certain provisions of the Fair Labor Standards Act to observers and observer contractors. In my response to you, I noted that NMFS was currently engaged in litigation regarding these issues, and that I would respond fully upon conclusion of the litigation.

The issues identified in your letter are complex and we now realize that comprehensive review of the statutes and associated policies must take place before we can be fully responsive to the Council's questions. I understand the importance of providing the Council with timely responses but I feel that it is essential that we complete this review before providing our reply. Thus, I expect that there will be some delay before we can provide answers to the Council's questions.

I have instructed staff to prioritize this review, and to seek input from the Department of Commerce and the Department of Labor as necessary. We will respond comprehensively as soon as we have completed the review and associated analyses, and resolved related policy implications.

Again, I greatly regret the delay in responding to the Council's questions. I understand that this may impact the Council's ability to address regulatory issues associated with the North Pacific Groundfish Observer Program in a timely manner. However, issues and concerns regarding observer remuneration and overtime must be properly analyzed and resolved.

Sincerely,

William T. Hogarth, Ph.D.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 24, 2004

Ms. Stephanie Madsen, Chair
North Pacific Fishery Management Council
605 West 4th, Suite 306
Anchorage, Alaska 99501-2252

Dear Ms. Madsen:

In a January 22, 2004, letter to you we discussed the basis of concerns about the administration of the North Pacific Groundfish Observer Program (NPGOP) with two different service delivery models in the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands management area (BSAI). Specifically, we raised concerns about problems that would arise under any alternative under consideration by the Council which does not incorporate a program-wide change to the service delivery model. First, procedures for dealing with observer performance and conduct problems under the current pay-as-you-go system would remain in place under any alternative that does not include all sectors in the BSAI and may be inadequate to maintain acceptable levels of data quality. Second, effects of observer wage and overtime determinations in a hybrid program may create differences in observer remuneration, which could create observer availability problems.

At its February 2004 meeting, the Council tasked the OAC with refining existing alternatives and/or exploring additional alternatives for the analysis which would expand the scope of the alternatives as they relate to the BSAI, as well as review and make changes to the problem statement as necessary. The Council also asked the OAC to discuss implications of a new NMFS policy regarding application of the Fair Labor Standards Act (FLSA) and Service Contract Act (SCA) which could affect observer remuneration and potentially increase observer service costs when NMFS contracts directly for observer services.

In a March 11 letter written in response to a February 11 letter from Chris Oliver, Dr. Hogarth indicated that NMFS would be unable to provide clarification to issues associated with the FLSA and SCA until pending litigation is concluded. For these reasons, NMFS staff present at the March 11-12 OAC meeting were unable to respond to questions about this new policy.

After extensive discussion, the OAC chose to advise the Council not to adopt the modified problem statement suggested by NMFS in the January 22 letter. The OAC also chose not to develop an alternative which would include a program wide change in the service delivery model. Instead, they developed a suite of alternatives which expanded the scope of the restructuring to certain sectors in the Bering Sea. None of the alternatives suggested by the OAC include a program wide change.

For the reasons stated in the January 22 letter to the Council, NMFS continues to urge the Council to add an alternative to the analysis which provides program-wide contractual arrangements between observer providers and NMFS. Impacts of the issues raised in this letter to overall data quality, administration and costs of the observer program only can be adequately and properly analyzed if an alternative exists which includes all sectors of the fleet.

Region and Center staff will continue to work with their counterparts in Washington DC and with Council staff to identify solutions to the issues identified above and on those portions of the analysis which don't hinge on the outcome of the litigation. However, we are unable to provide a complete analysis of the application of the FLSA and SCA policy until the litigation is concluded. Pending the timely conclusion of litigation, we anticipate being able to have an initial analysis to the Council by October.

Sincerely

James W. Balsiger
Administrator, Alaska Region

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

MAR - 8 2004

Mr. Chris Oliver
Executive Director
North Pacific Fishery Management Council
605 West 4th Avenue
Anchorage, Alaska 99501

Chris
Dear Mr. Oliver:

Thank you for your letter raising concerns about the implications of the agency position as it relates to wages and overtime pay for contracted fisheries observers.

The specific issues you have identified for a response are as follows:

- Whether and how the policy considers observers under the Fair Labor Standards Act exemption for employees engaged in fish harvesting operations or fish processing operations;
- How the agency's position on wages and overtime pay for contracted fisheries observers would impact observer compensation costs under a direct contract approach for the North Pacific Groundfish Observer Program;
- Whether the agency's position on wages and overtime pay for contracted fisheries observers would require that observers be compensated on an hourly basis plus overtime pay for all non-productive hours; and
- If observers are not required to be compensated for non-productive hours, how would the number of productive hours be verified?

I welcome the opportunity to address these issues. However, the agency is currently involved in litigation before the U.S. district court in Washington and before the General Accounting Office related to some of these very same issues. Therefore, I must refrain from providing a detailed response at this time. A thorough response to these questions will be provided as soon as the litigation concludes.

In the meantime, I urge you to continue to work with the Alaska Region and Alaska Fisheries Science Center on efforts to restructure the North Pacific Groundfish Observer Program to address data quality issues inherent in the current service delivery model.

Sincerely,

Rebecca Lent
for William T. Hogarth, Ph.D.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

North Pacific Fishery Management Council

Stephanie Madsen, Chair
Chris Oliver, Executive Director

Telephone: (907) 271-2809

605 W 4th Avenue, Suite 306
Anchorage, AK 99501-2252

Fax: (907) 271-2817

Visit our website: www.fakr.noaa.gov/npfmc

February 11, 2004

Dr. William Hogarth
NOAA Fisheries
1315 East-West Highway
Silver Spring, MD 20910

Dear Dr. ~~Hogarth~~ Bill:

At its recent meeting in February, the North Pacific Fishery Management Council (Council) scheduled a review of issues related to the North Pacific Groundfish Observer Program (Observer Program), and progress on a preliminary analysis to modify the existing service delivery mode to one in which NOAA Fisheries would contract directly with observer providers for observer services. The Council is currently supporting development of this analysis, the alternatives of which propose changing the observer deployment and funding mechanism for all vessels and shoreside processors operating in the Gulf of Alaska, with the potential to also include vessels operating in the Bering Sea and Aleutian Islands (BSAI) that currently have less than 100% observer coverage requirements.

As part of this agenda item, the Council reviewed a letter received from the Administrator of NMFS, Alaska Region, on January 22, 2004. This letter outlines agency concerns regarding: 1) the existing procedures for addressing observer performance and conduct problems, and 2) the potential consequences of a recent NMFS policy which defines wage rates and overtime requirements for contracted observers. Recognizing the potential disparity that may result between areas with regard to these issues if the Council moves forward with a direct contract model only in the Gulf of Alaska, the Regional Administrator recommended that the Council include an alternative in the analysis that would extend the direct contract model proposed for the Gulf of Alaska to the BSAI, thereby reflecting a program-wide restructuring of the Observer Program. The effect of the alternative is that all observer services in the North Pacific would be provided by observer companies under direct contractual arrangements with NMFS, thus the procedures for addressing observer performance problems and observer wage rates would be consistent among areas.

While supportive of exploring the addition of a program-wide alternative, the Council is concerned with the implications of the NMFS position[1] on observer wages that has come to light during deliberations on this action. It is the understanding of the Council that NMFS maintains that the wage and overtime pay requirements of the Service Contract Act (SCA) and Fair Labor Standards Act (FLSA) apply to fisheries observers employed in programs under which NMFS has direct contractual arrangements with observer

[1]Memorandum from William T. Hogarth, Ph.D. to Terry H. Lee regarding Applicability of Overtime Pay for Fisheries Observers (November 13, 2003).

providers. This is a very complex issue, and the potential consequences are difficult to predict at this time. However, implementation of this policy raises serious financial and operational concerns that may significantly affect the operation of the North Pacific fisheries under the proposed direct contract model. On its face, the application of the FLSA requirements to fisheries observers could result in a significant increase in labor costs. While observers typically engage in productive work in excess of 40 hours per week due to the nature of the work, they are often placed on a vessel for several weeks at a time (the entire length of the vessel trip), with a considerable amount of time spent as "waiting time." Under the NMFS policy, if observers are not considered exempt from the FLSA, providers could be required to compensate observers for 168 hours per week (productive time and waiting time) with every hour in excess of 40 hours being paid at 1.5 times the basic rate of pay. Review of the FLSA indicates that the potential for this interpretation is quite possible, as the law requires that an employee must be compensated for all hours worked, and working time is not limited to hours spent in active productive labor, but also includes "on call" time or time spent idle and waiting for work (29 CFR 778.223). The Council is thus concerned with further interpretation of the requirements of the FLSA and whether the policy would require that observers be compensated on an hourly basis, including overtime hours, for all non-productive "waiting time" spent onboard vessels. Should the policy be clarified such that observer providers are not required to compensate observers for non-productive "waiting time," it is unclear how the observer provider would verify the number of productive hours and overtime hours worked.

In addition to the potential cost impacts and the need for further clarification of the NMFS policy, the Council questions the rationale used for determining that contracted fisheries observers on vessels and in shoreside processing plants are necessarily subject to the wage and overtime pay requirements of the FLSA overall. The Council's understanding is that there are three separate exemptions to consider under the FLSA provisions: 1) exemption for executive, administrative or professional employees; 2) exemption from both the minimum wage and overtime requirements for employees engaged in fishing operations;[2] and 3) exemption from overtime requirements for employees engaged in processing operations.[3]

Additionally, and importantly, work performed beyond U.S. territorial waters is outside the jurisdiction of the SCA and the FLSA. The memo of November 13, 2003, identifies that the jurisdictional issue with regard to U.S. territorial waters was considered, but the agency decided that tracking the geographical location of a vessel in order to determine whether the SCA/FLSA wages apply represents an excessive administrative burden. The rationale used for dismissing the territorial waters exemption does not seem adequate in the Council's opinion, particularly given the significant cost implications to the fishing industry which are associated with that policy determination.

The Council also questions the agency's rationale for determining that fisheries observers are not exempt under the blanket exemptions for employees engaged in fishing or fish processing operations as identified in Section 13(a)(5) and Section 13(b)(4) of the FLSA, respectively. These exemptions appear to be designed to address the unique nature of fisheries operations and employees who work at sea. The implementing regulations further clarify that for the purpose of the above mentioned exemptions, an employee is considered "employed in" a fishing or fish processing operation where his/her work is "an essential and integrated step

---

[2]This refers to the section 13(a)(5) exemption. 29 CFR 784.100.

[3]This refers to the section 13(b)(4) exemption. 29 CFR 784.101.

in performing such named operation, or where the employee is engaged in activities which are functionally so related to [fishing operations] ...that they are necessary to the conduct of such operation (20 CFR 784.100)."

Observers are an integral and necessary part of the fishing operations in the North Pacific, in that the data collected by observers is used for multiple conservation and management purposes, including in-season management of the harvest and development of the annual stock assessments. To ensure data is collected to meet these purposes, observers are required on all vessels greater than 60 feet length overall for various time periods, as well as in shoreside processing plants and on stationary floating processors in both the Gulf of Alaska and the BSAI. Thus, while the duties performed by the observer are functionally related to the ongoing and responsible prosecution of the fisheries, the operation of these vessels and processors could also not be legally conducted without the observer performing his/her work. The importance of the observer's work to the sustainable management of the North Pacific fisheries has been frequently recognized by the Council, NMFS, the fishing industry, and the public, and has been required in Federal regulation for the domestic groundfish fisheries since 1989.

There is no question that the Council values the work performed by observers and believes observers should be paid fairly for their work. However, the current service delivery model and industry-funded system in the North Pacific remains different from other government-funded observer programs around the nation. The current service delivery model is one in which individual vessels and processors contract directly with an observer provider, and the direct cost of observer services is funded wholly by those vessels and processors required to have observer coverage. In 1997, observers organized to bargain for better compensation and working conditions, and currently, the Alaska Fishermen's Union has contracts with three of the four existing observer providers. The collective bargaining agreement developed through the union has formed the basis for observer compensation for the past several years, and is recognized as a fair and comprehensive process by which to develop wage rates to compensate observers for the specific and unique characteristics of their work.

While the current Observer Program in the North Pacific is recognized as quite successful, the Council has engaged in ongoing efforts with the agency and the public to improve the existing program. The Council's Observer Advisory Committee was constituted several years ago to facilitate this effort. It is through this committee that the Council has recently been working to develop an analysis to modify the existing service delivery model to one in which the agency would contract directly with observer providers for observer services, to be funded by a uniform fee on all vessels and processors included in the program and/or Federal funding. Clearly, the proposed change to a system in which the government has a direct contractual arrangement with observer providers will have direct cost impacts to industry, and these must be comprehensively analyzed and considered in the analytical document supporting an FMP amendment. The Council has an Observer Advisory Committee meeting scheduled for March 11 - 12, 2004, to further develop~~ment~~ alternatives, elements, and options for this amendment package. Given the recently identified issues described above, it is clear that application of the SCA/FLSA wage and overtime requirements under the new NMFS policy could significantly affect cost estimates for a program in which NMFS directly contracts with observer providers, although lacking further clarification, it is uncertain to what degree costs would be affected.

In sum, the Council believes the potential cost impacts and implementation concerns associated with the agency policy on wage and overtime pay requirements give sufficient cause to urge NOAA Fisheries to reconsider its recent policy on observer compensation issues as identified in the November 13, 2003 memo.

Specifically, the Council respectfully requests a response from NOAA Fisheries on the following issues:

(1) whether and how the policy considers observers under the Fair Labor Standards Act exemption for employees engaged in fish harvesting operations (Section 13(a)(5)) or fish processing operations (13(b)(4));
(2) how the new wage and overtime policy would impact observer compensation costs under a direct contract approach for the North Pacific Groundfish Observer Program;
(3) whether the policy would require that observers be compensated on an hourly basis plus overtime pay for all non-productive ("waiting time") hours spent on board vessels or in shoreside processing plants; and
(4) if observers are not required to be compensated for non-productive hours, how would the number of productive hours worked be verified if the policy requires providers to compensate observers on an hourly basis?

In order to proceed productively with the Observer Advisory Committee meeting, analytical efforts to restructure the Observer Program in the North Pacific, and the Councils' further consideration of these issues at our April meeting, the Council requests that NOAA Fisheries HQ address and resolve the issues identified above as soon as possible, preferably prior to the Observer Advisory Committee meeting scheduled for March 11 - 12, 2004. The Council is committed to working with NMFS and the North Pacific Groundfish Observer Program to continue to improve what is recognized as one of the most comprehensive and effective observer programs in the world. Thank you in advance for considering the requests identified above.

Sincerely,

Chris Oliver
Executive Director

cc: Dr. Jim Balsiger
Dr. Bill Karp
Ms. Sue Salveson
Ms. Vicki Cornish
Ms. Lisa Lindeman

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

NOV 1 3 2003

MEMORANDUM FOR: Terry H. Lee
Office of General Counsel

FROM: for William T. Hogarth, Ph.D.

SUBJECT: Applicability of Overtime Pay for Fisheries Observers

This memo supplements a request from Mr. Abe Vinikoor of the Western Administrative Support Center (WASC) for an legal opinion from the Department of Commerce Office of General Counsel (DOC OGC) on whether contracted fisheries observers are entitled to overtime pay. It provides justification for the National Marine Fisheries Service (NMFS) position that contracted fisheries observers are non-exempt from coverage under the Fair Labor Standards Act and other Acts, as appropriate, by virtue of their status as technicians, and therefore are eligible for overtime pay.

Based on information provided by DOC OGC and Department of Labor representatives during a workshop sponsored by the NMFS' National Observer Program (see Appendix 1; Fisheries Observers Insurance, Liability, and Labor Workshop, section 4.2, pp. 17-20), it was determined that NMFS needed to clarify the status of observers as either professionals (which are exempt from coverage under the Fair Labor Standards Act), or technicians (which are non-exempt).

This issue was discussed at a subsequent meeting of the National Observer Program Advisory Team. The National Observer Program Advisory Team is comprised of representatives from each NMFS region and headquarters office. The Advisory Team works with NMFS' National Observer Program staff in the Office of Science and Technology to identify issues of national concern, to recommend or establish priorities for national research and problem solving, and to support information collection and program implementation. The team, at its October 2001 meeting, recommended that the National Observer Program develop a Position Description for fisheries observers that would clarify their status as technicians, using the Biological Technician series (GS-404) as a starting point. It was recommended this Position Description be forwarded to the Department of Labor for consideration in issuing future Wage Rate Determinations and for inclusion in the Service Contract Act Directory of Occupations (see http://www.dol.gov/esa/regs/compliance/whd/wage/main.htm). This clarification would provide consistency in wages paid to observers in various regions of the U.S. In addition, it would help clarify pay scales for work performed on land and at sea and aid in determining appropriate types of benefits, i.e., overtime compensation.

The National Observer Program, in consultation with the National Observer Program Advisory Team, reviewed the duties and responsibilities of fisheries observers and developed a classification scheme identifying three levels of Fishery Observer for consideration by the

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Department of Labor (Level I/II/III). I sent a letter to Mr. William Gross, Director of the Department of Labor's Wage Determination Division on September 9, 2002 (see Appendix 3) to that effect. That letter, along with a subsequent letter dated November 6, 2002, resolved to establish wage rates for contracted fisheries observers that are comparable to Federal Observers under the General Schedule (GS) system.

The development of Fishery Observer Position Descriptions for consideration by the Department of Labor was prompted by inconsistencies in wage rate determinations that had been made up to that point, and the fact that these wages were considerably less than the federal equivalency for the same type of position. Wage rate determinations issued by the Department of Labor for various localities stipulated minimum hourly wages ranging from $9.55/hour (2001 for California, Oregon, Washington) to $10.59/hour (2001 for California County of Los Angeles), whereas the 2003 hourly pay scale for GS-5 employees is $11.23/hour (see http://www.opm.gov/oca/03tables/pdf/gs_h.pdf). If the Department of Labor had a uniform national standard for making wage rate determinations for fisheries observers, then there would be more consistency in wage rates for contracted observers, and these wages would reflect wages that would be paid to federal employees performing the same job functions.

In developing the position that contracted fisheries observers are technicians, the National Observer Program, in consultation with the National Observer Program Advisory Team, considered both the duties and responsibilities of fisheries observers as well as past recruitment actions for Federal fisheries observers (see Appendix 4). In a 1999 Vacancy Announcement for Federally-employed fisheries observers in Hawaii that was issued before the program was converted to a contracted program, recruitment for fisheries observers were for Biological Science Technicians (ZT-404-II, equivalent to GS-5 through GS-8).

The classification of fisheries observers as technicians is also consistent with guidance from the Office of Personnel Management's classification standards for (see The Classifier's Handbook, Chapter 4 "Determining the Pay System and Series" at http://www.opm.gov/fedclass/clashnbk.pdf). The duties and responsibilities of fisheries observers involve adhering to routine sampling protocols that are planned and managed by professional employees. Fisheries observers perform these duties unsupervised, but all work is carefully reviewed for completeness and accuracy by professional biologists. Although most of the contracted observer programs currently require that observers have a professional degree (usually a Bachelor's degree in a biological science) as an eligibility standard for recruitment by the contracted observer service provider, specialized experience can be substituted for education (see also Appendix 4, Qualifications). Observers then receive up to three weeks of specialized training, which must be completed to the satisfaction of the program before observers are certified to be deployed aboard fishing vessels.

Therefore, NMFS maintains the position that fisheries observers are biological technicians and are therefore eligible for overtime compensation under the Service Contract Act (SCA), the Fair Labor Standards Act (FLSA), and other Acts stipulating wages and benefits for contracted service employees, as appropriate.

While we understand that work performed by observers beyond U.S. territorial waters is outside of the jurisdiction of the SCA and FLSA, attempting to track the geographical location of a vessel in order to determine whether or not SCA/FLSA wages apply would be a huge administrative burden for both the contracted observer provider and the agency. Therefore, it is the position of NMFS that the wage rate that the Department of Labor determines is appropriate for each specific locality should be applied to contracted fisheries observers whether they are working inside or outside of U.S. territorial waters in order to provide a fair, simple, and consistent application of the SCA/FLSA.

If you concur with this position, we strongly encourage you to advise WASC to request a revised Wage Rate Determination from the Department of Labor for Honolulu, as well as for localities that may be associated with the deployment of observers under current West Coast observer contracts as well as those solicited in the future. This would apply to contracts, cooperative agreements, and grants issued for the deployment of observers in the Alaska Marine Mammal Observer Program, the West Coast Groundfish Observer Program (via a cooperative agreement with the Pacific States Marine Fisheries Commission), and the California Longline and Gillnet Observer Programs. This will ensure that wage rates for fisheries observers reflect the new Position Descriptions for Fishery Observers that were provided to the Department of Labor in 2002, and that overtime pay is provided under these contracts in accordance with the SCA, FLSA, or other applicable laws.

Attachments

Appendix 1.

Excerpt from the Final Report of the Fisheries Observers Insurance, Liability, and Labor Workshop, June 12-14, 2001 (Section 4.2, pp. 17-20)

Appendix II - FLSA memos

ɔmetimes find themselves having to assist ıshermen with the fishing operation. If an injury occurred to an observer while they were taking part in the fishing operation, the policy would be nullified.

Furthermore, in many regions, vessels do not have P&I insurance. This is more common with small vessels, especially those operating in the Gulf of Mexico and Alaska.

Q: How does compensation under the Jones Act work?

Under the Jones Act, if a vessel is considered negligent, the injured seaman can sue for compensation. If awarded by the court, compensation may be provided beyond the "maintenance and cure" typically provided by employers (or their insurers). Compensation is paid retroactively from the time of injury forward. In lieu of this compensation or until an award is made, maintenance is provided to cover food and other incidental expenses (typically at no more than a modest $26/day, based on average maintenance costs while at sea). Wages are also paid, but only from the point of injury to home. Transportation costs are also limited to getting the injured individual home. Hence, Jones Act remedy is not all that attractive until a case gets to the litigation stage and only then if a jury agrees that the plaintiff deserves a lot more compensation.

4.2 Applicability of the Service Contract Act, Contract Work Hours and Safety Standards Act, and the Fair Labor Standards Act to observers as they pertain to pay for hours worked beyond 40 hours per week

Supplemental meeting materials may be found In Appendix B, Appendix C, Appendix D, and Appendix E.

Tom Obert, *Department of Labor*
Wage and Hour Division
Washington, D. C.

In 1965, the Service Contract Act (SCA) was established to set standards for wage rates and to fill gaps that existed in government contracts. Because the principle cost in service contracts is wages of staff working on the contract, there was concern that competitive bidding and ⁻ward of contracts to the lowest bidders ɔuld cause wage rates to decrease below acceptable levels. The SCA was intended to remedy this problem.

Observer programs generally contract for services through the use of service employees and are therefore subject to the SCA. Generally, only professional or administrative employees are exempt from the SCA. The definitions of professional and administrative employees are found in the Fair Labor Standards Act (FLSA) and are how FLSA links with the SCA. Exempt employees are those that are salaried, do not receive overtime pay, and are required to have at least a bachelor's degree to conduct the specific work for which they are employed. Non-exempt employees have hourly wage rates set, and are paid overtime for hours worked over a 40 hour workweek. The

Act itself does not define who these employees are; these are defined in CFR 29 Part 541. The SCA also does not address overtime directly; this is covered by FLSA or by the Contract Work Hours and Safety Standards Act (CWHSSA).

Although the CWHSSA deals with overtime compensation, it is limited to laborers and mechanics and thus does not figure prominently in work performed by observers. In addition, it is unclear whether CWHSSA has the same geographical limits as FLSA, for example, if a vessel departed a port in US waters and steamed beyond US Territorial Waters, but returned within 40 hours, the vessel would be covered by FLSA, but it may not be covered under CWHSSA.

Observers are paid wages that are based on an hourly rate and are clearly service employees, thus, they are covered by the SCA. However, because the FLSA does not apply beyond the U.S. territorial waters (12 miles from shore), and some observers work beyond this point, there may be periods when observers are exempt from the SCA. Technically, observers (and their employers) are only subject to these laws for that portion of work performed inside territorial waters. This makes the application of the requirement to pay overtime more confusing.

> *"For the most part, observers are working in international waters, beyond the scope of the U.S. You're not going to have either SCA or FLSA coverage during that time at sea."*
> *T. Obert*

Mark Langstein, *Department of Commerce, General Counsel*
Contract Law Division
Washington, D.C.

As described by Mr. Obert, the Contract Work Hours and Safety Standards Act provides guidance for overtime compensation, but would generally not apply to observers because their tasks and functions are considered technical and scientific, not manual labor. However, observer programs would have to be assessed on an individual program by program basis to determine whether the Contract Work Hours and Safety Standards Act would apply in specific cases. Based on existing programs, it is likely that observers would be considered professional employees and not manual laborers and therefore the Act would not apply. For example, taking biological samples, other measurements, and maintaining records would not be considered manual labor, even if the work were physically demanding at times. Additionally, a minimum of a Bachelor's degree or other special training is usually required to be an observer.

Discussion and Q&A session

Q: What is the definition of salary?

Salary is basically a set amount employees receive regardless of the number of hours worked over a specified amount of time. The Department of labor (DOL) normally issues wage determinations under the SCA. In a collective bargaining agreement, DOL is obligated to issue a wage rate and fringe benefits and a daily rate may be negotiated. However, it is

not clear whether a daily rate constitutes a salary for the purposes of the FLSA.

It was the understanding of some panelists and participants that observers would not be exempt from the provisions of the SCA and FLSA. The CWHSSA provides the ability to apply liquidation standards, which allows the US Government to recover dollars if overtime was not properly paid to employees, but the SCA does not. Hours worked are defined in 29 CFR 785.6.

Q: What is the area covered by the Outer Continental Shelf Act as it relates to territorial waters and overtime?

With regard to distance from shore, the area covered by the Outer Continental Shelf Act was based on the distance and depths at which offshore drilling used to occur (out to 100 fathom contour, or a depth of approximately 600 feet). This is likely to be the same basis as for the SCA and FLSA as to why they do not cover employees outside of Territorial waters.

Q: If observers are considered biological technicians, what effects does the FLSA or CWHSSA have on them?

They would be non-exempt under the SCA, but then a determination remains regarding which overtime law applies, the FLSA or CWHSSA. The CWHSSA only applies to labourers and mechanics, whereas the FLSA applies to everyone else. If observers are paid hourly and considered non-exempt for purposes of overtime laws, the FLSA or CWHSSA requires that they be paid time and one half for overtime. But confusion obviously exists, and the application of these standards is currently inconsistent. In the Southeast US, one NOAA Fisheries observer program considers observers exempt, and pays a daily rate or salary, not an hourly wage. Another NOAA Fisheries observer program does not consider observers exempt and pays an hourly wage plus overtime.

Q: How are "Agreements" viewed by DOL?

While the SCA deals only with contracts, for the purposes of this Act, all "agreements," even those lacking a clear contract, are considered to have the "intent" of a contract, thus making the Act applicable.

Q: Who sets the wage determinations?

Although the Department of Labor issues wage rate determinations, NOAA Fisheries or their contractors provide the information used to make those determinations. Currently, NOAA Fisheries has seven wage rate determinations for fisheries observers operating in various parts of the country, each with a different wage rate.

Generally, federal observers have been hired at a rate equivalent to GS-5, Step 1. However, the current wage determination rate for some observers is more in line with a GS-3 rate. It was unclear to the observer program managers whether this determination was based on information provided to the Department of Labor by NOAA Fisheries, or from some other source. However, anyone can request a review and re-consideration of a wage rate. If the practice of a federal direct hire for a GS-5 was to include hazardous pay,

then this must be taken into account in the equivalent observer wage rate determinations issued by DOL.

Q: What is the penalty for an agency not going to the Department of Labor and asking for a wage determination?

There is no particular penalty, however, if it comes to the attention of the Department of Labor, then they send a letter to the agency to rectify the problem, retroactively. Employees do not have private right of action under the SCA. DOL has sole enforcement authority and is mandated by statute to act on the employees' behalf. Under the FLSA, an employee can sue their employer for inappropriate wages, but they cannot sue under the SCA. However, in the event of an injury, different laws and different rules apply.

Q: Are there processes set up for dealing with cumbersome circumstances, for instance, locality keeps changing or employees keep moving around?

If the nature of the job is such that employees work from different locales, the Department of Labor uses head-up points, which refers to where the trip began. Multiple landings do not negate the SCA requirements.

Q: What is the applicability of the SCA to observers in the North Pacific groundfish observer program, considering its unique service delivery model?

There have been two rulings (by different agencies) regarding the applicability of the SCA to observers employed by private companies supplying observers for the North Pacific Groundfish Observer Program (NPGOP). One, by NOAA Fisheries, determined that the SCA did apply. The other, by the Department of Labor, determined it did not apply.

In the NPGOP, even though there is not a direct contract between NOAA Fisheries and the private companies or service providers that employ the observers, NOAA Fisheries has presumed that the situation met the intent of an "agreement" between the two parties and therefore fell under SCA requirements. NOAA Fisheries has therefore been requiring the observer service providers to meet the requirements of the SCA. However, it was the position of the General Counsel of the Department of Labor that under the NPGOP there was not a contract, therefore the SCA was not applicable.

The Department of Labor has final authority on labor issues. These kinds of questions should go to Labor for the appropriate expertise.

If observer companies in the NPGOP are required to pay SCA wages, but do not, the Department of Labor could issue a three-year debarment. There is no avenue for early removal of this debarment period once it is in place. During an investigation, if a contract was found out to have a wage rate, a determination would be made and the investigation would resume.

It was noted that, observers in the NPGOP worked outside of Territorial Waters most of the time, where the SCA or the FLSA does not appear to apply.

Appendix 2.

Excerpt from the minutes of the October 2001 meeting of the National Observer Program Advisory Team.

Topic: Observer Roles, Duties & Responsibilities

A better definition could help address the following:

- Determining pay for observer work performed on land and at sea
- Determining appropriate types of benefits
- Obtaining appropriate Department of Labor Wage Rate Determinations
- Defining the status of observers under FECA
- Establishing hiring standard guidelines for observer contractors

There was discussion as to whether observers were in the technical vs. professional series, and there was agreement that beginning observers were technicians, even though increasing job responsibilities may make them eligible for professional series positions down the road. There was clarification that even though observers are exposed to hazardous conditions, which may make them eligible for hazardous duty pay, this does not change their basic job duties. Job descriptions should also include compliance monitoring responsibilities where appropriate. It was noted that there is currently a lack of consistency between regions with respect to how observers are paid, i.e., and what constitutes a work day.

Observer Definition - It was agreed that:

- A new position description for observers should be developed using the Biological Technician position as a starting point. The name should be something like "Marine Resources Observer."

This new Position Description could be used by NMFS to:

- Request revision of current DOL Wage Rate Determinations
- Define observers for purposes of FECA compensation (which may require references to the various Service Delivery Models). This may require considerable discussions and further analysis under the Risk Management Plan.
- Develop recruitment guidelines for observer service providers
- Amend federal job Position Description library to include "Marine Resources Observer."

Appendix II - FLSA memos

Appendix 3.

Letter from Dr. William Hogarth, National Marine Fisheries Service, to Mr. William Gross, Department of Labor Wage Determination Division, regarding Position Descriptions for Fishery Observers (September 9, 2002),

and

Subsequent letter to Ms. Sandra W. Hamlett, Department of Labor Employment Standards Administration, clarifying Federal GS equivalencies for Fishery Observers (November 6, 2002).

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, Maryland 20910

THE DIRECTOR

SEP - 9 2002

Mr. William Gross
Director, Wage Determinations Division
U.S. Department of Labor
Frances Perkins Building
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. Gross:

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) is submitting the enclosed multi-level position descriptions for use by the Department of Labor (DOL), Wage and Hour Division in determining wage rates for contracted fisheries observers. NOAA Fisheries drafted these descriptions clearly defining fisheries observer duties and responsibilities with the intent that they would be incorporated in the DOL's catalog of job categories.

Our regional observer programs are resolved to establishing wage rates for contracted fisheries observers that are comparable to Federal observers under the General Schedule (GS) system. Therefore, to assist DOL in establishing appropriate wage rates for fisheries observers, we are also providing equivalent federal wage rates for similar positions. Entry level wage rates for federally hired fisheries observers (analogous to the Fisheries Observer Level I position description enclosed) have historically been based on a GS-5 step-1 hourly rate. Once incorporated, these descriptions should ensure that wage rate determinations for contracted fisheries observers are rendered from a uniform national standard.

I appreciate your attention to this request. Please contact Dennis Hansford in the Office of Science and Technology at 301-713-2328, ext. 217 regarding actions taken by DOL in addressing this request.

Sincerely,

William T. Hogarth, Ph.D.

Enclosures

cc: F/ST, F/ST1, F/ST1:DHansford:VCornish, GCF, F/CU(2)
NMFS:F/ST1:DHansford:713-2328:ddh:9/4/02
Revised By:DHogans:9/6/02

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

FISHERY OBSERVER I

Performs routine tasks associated with recurring and continuing work according to prescribed or established procedural standards and technical methods assigned. Assures that tasks are completed, data developed, methods used in securing and verifying data are technically accurate and in compliance with instructions and established procedures. Makes estimates of amounts and species composition of fish caught, retained and discarded, using at a minimum, simple, single stage sampling techniques and dichotomous keys. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. According to established standards and detailed procedures, records data on appropriate forms and logs, some of which may be electronic. Maintains field equipment and supplies. Collects scientific, management, compliance information, and make observations of fishing operations. Use and complete a pre-boarding vessel safety checklist. Measures selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. May tag species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Uses calculator and/or PC for calculations and recording data. Obtains, enter and transfer data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. May use interpersonal and communication skills to contact fishermen and schedule observer sampling trips. May observe and document compliance with fishery regulations, and may write affidavits. May camp at remote sites and may operate All Terrain Vehicles (ATV's) and skiffs.

FISHERY OBSERVER II

Independently executes duties, while learning when and how to resolve exceptions and special problems or to make adaptations in the procedures. Makes estimates of amounts and species composition of fish caught, retained and discarded, utilizing knowledge of various statistically valid sampling methods and dichotomous keys. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. According to established standards and detailed

procedures, records data on appropriate forms and logs, some of which may be electronic. Supplies in-season reports. Maintains field equipment and supplies. Use and complete a pre-boarding vessel safety checklist. Collects scientific, management, compliance information, observations of fishing operations, measure selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. Participates in tagging species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Uses calculator and/or PC for calculations and recording data. May enter and transfer data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. Uses knowledge of interpersonal and communication skills while contacting fishermen to schedule observer sampling trips and may coordinate observer activities with appropriate State agencies. May observe and document compliance with fishery regulations, and may write affidavits. May camp at remote sites and may operate All Terrain Vehicles (ATV's) and skiffs. May participate in aerial surveys and surveys to provide abundance data or describe fisheries to be used in observer data analysis and program design.

FISHERY OBSERVER III

Acts as field coordinator and primary debriefer of lower graded Fishery Observers. Oversees and tracks debriefing lower graded Fishery Observers, final data review, data editing and entry. Demonstrates extensive familiarity of methods, procedures and management to ensure proper day-to-day operations. Shifts from one type of responsible technical assignment to other types, which are different in terms of equipment used, of data used, and uses to which data will be put. Acts as primary field contact to address sampling, data, and deployment issues. Makes recommendations so as to increase the efficiency of recruiting, training, and safety components of the program. Supplies in-season reports. Independently executes duties, while learning when and how to resolve exceptions and special problems or to make adaptations in the procedures. Collects biological samples from the catch of various fisheries according to detailed program and gear specific procedures. Makes estimates of amounts and

species composition of fish caught, retained and discarded, utilizing knowledge of various statistically valid sampling and sub-sampling methods and dichotomous keys. According to established standards and detailed procedures, records data on appropriate forms and logs, some of which may be electronic and provide recommendations for updates. Oversees the maintenance of field equipment and supplies. Use and complete a pre-boarding vessel safety checklist. Collect scientific, management, compliance information, observations of fishing operations, measure selected portions of catch including incidentally caught marine mammals, sea birds and sea turtles. Participates in tagging species of interest including sharks, tunas, sablefish, spiny lobsters, swordfish and sea turtles. Use calculator and/or PC for calculations and recording data. Enters and transfers data electronically. Obtains and record information on electronic equipment, socio-economics and gear characteristics of fishing gear types while working either on board vessels, on an alternative platform, or at a shore-based facility. Uses knowledge of interpersonal and communication skills while contacting fishermen to schedule observer sampling trips and coordinate observer activities with appropriate State agencies. Observes and documents compliance with fishery regulations, and write affidavits as required. Camps at remote sites and operates All Terrain Vehicles (ATV's) and skiffs as required. Participate in aerial surveys and vessel surveys to provide abundance data or describe fisheries to be used in observer data analysis and program design.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1315 East-West Highway
Silver Spring, MD 20910

THE DIRECTOR

NOV - 6 2002

Ms. Sandra W. Hamlett
U.S. Department of Labor
Employment Standards Administration
Wage and Hour Division
Washington, D.C. 20210

Dear Ms. Hamlett:

This is in response to your letter regarding the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) Observer Position Descriptions. Your letter requested Federal Grade Equivalencies for the three levels of Fishery Observer positions that NOAA Fisheries submitted for inclusion in the Department of Labor's Service Contract Directory of Occupations.

The Federal Grade Equivalencies for the three Fishery Observer positions are as follows:

- Fishery Observer I = GS-5 step 1
- Fishery Observer II = GS-6 step 1
- Fishery Observer III = GS-7 step 1

If you require any additional assistance in this matter, please contact Dennis Hansford at 301-713-2328, Ext. 217.

Sincerely,

William T. Hogarth, Ph.D.

cc: F/ST:F/CU:F/ST1:F/ST1:DHansford:Cornish
Drafted by:DHanfords:713-2328:11/5/02:a:GSequiv.forDOL.wp

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

Appendix II - FLSA memos

Attachment 4.

Vacancy Announcement for Fisheries Observers in Honolulu, Hawaii (July 1999)

U. S. Department of Commerce

VACANCY ANNOUNCEMENT

National Oceanic & Atmospheric Administration (NOAA)

Opening Date:	07/23/99
Closing Date:	08/23/99
Position Title:	Biological Science Technician (Fisheries)
Series & Grade:	ZT-0404-II (equivalent to GS-05 through GS-08)
Duty Station:	Honolulu, HI
Vacancy Number:	W/NMF/SWR/99~~0000~~0475.LN
Organization:	National Marine Fisheries Service (NMFS) Southwest Region (SWR) Pacific Islands Area Office
Area of Consideration:	Any U.S. citizen
Work Schedule:	Full-Time Seasonal
Type of Appointment:	Term Appt NTE Fifteen Months and may be extended without further competition
Number of Vacancies:	Twelve
Service:	Competitive
Salary Range:	Annual: $20,588 to $36,711 Hourly: $9.86 to $17.59 (plus a 25% cost of living allowance) **Starting salaries may be set anywhere within the pay range of a pay band.**

Notes: DOC applicants may be considered before all others. Payment for relocation expenses is not authorized. All status applicants who wish to be considered under both Merit Assignment Plan (MAP) as well as Agency-Based (AB) procedures must submit two complete applications. When only one application is received, qualified status candidates will be considered under MAP only and qualified nonstatus applicants will be referred under AB procedures. If in doubt as to which category applies to you, submit two applications. Work is expected to last more than 6 months but less than 11 months per year. Qualified individuals with ocean experience aboard small boats are especially encouraged to apply. Selectees must be able to pass a preemployment physical examination administered by the NMFS in Honolulu, HI or Long Beach, CA. Work is full-time, however it may be interrupted by short periods of nonpay status due to lack of fishery activity.

Duties: Sea-going observers work 40 or more hours per week as the only government employee aboard privately-owned commercial fishing vessels. The observers collect needed information to assess the incidental involvement of protected species in the Hawaii longline fishery, including data on fishing effort and animal life history.

Supplemental Information:

Training: Begins upon appointment and continues for 3 weeks. Trainees must satisfactorily complete written tests with an overall average score of 85% or greater, demonstrate their potential to collect accurate field data, and

exercise their astuteness and reaction to unfamiliar situations at sea in a professional manner in order to qualify for sea assignments. Failure to meet these criteria will result in termination of employment.

Cruises: Vessels operate from Hawaiian ports on the islands of Oahu and Hawaii. Observers travel by public transportation to meet their assigned vessels, and are expected to remain with their assignments until the fishing trips end. Typically, trips are 2 to 6 weeks in duration. Vessels operate in the open ocean in all weather and sea conditions.

Vessel Description and Accommodations: The commercial fishing vessels are small, generally from 50 to 110 feet in length. Crew members and observers live and sleep in cramped quarters, often in damp conditions, and share common toilet facilities. The majority of vessels have no showers, and many lack permanent toilets. Although vessels do not have separate facilities for women, federal law requires reasonable privacy. Observers work at sea aboard some vessels where the crew does not speak English and serve exclusively ethnic food such as rice and raw or dried fish. Because of the small size of these vessels and their response to sea conditions, motion sickness can be debilitating for some individuals and should be seriously considered by all applicants.

Mandatory Nonduty/Nonpay: During times of low levels of fishing activity, and when vessel assignments are unavailable, observers are placed in nonduty/ nonpay status. They may be placed, although rarely, in nonpay status for up to 3 months per year.

Other Conditions:

- Vessels carry no trained medical personnel aboard and rely upon the first aid knowledge of the operators and crews.
- Observers must be capable of moving animal carcasses up to 200 pounds each and have clear distant vision (correctable to 20/20 in one eye and to 20/40 in the other) for observing marine animals in the wild.
- Psychological stress may be potentially high since the observer is the sole government employee living in confined quarters with commercial fishermen whose work may conflict with observer duties.
- Observers do not choose vessel assignments. Vessel suitability is determined by the U.S. Coast Guard and management. Management selects sea assignments through a predetermined sampling plan and confirms that the boats meet U.S. Coast Guard safety requirements. Fishing activity dictates vessel departures and arrivals. Since vessel notification requirements limit response time, observers must be prepared for sudden sea assignments of extended and uncertain duration. Refusing assignments may be grounds for dismissal.
- When at sea, observers work in a self-supervised capacity, and receive premium pay above their base salary.

Qualifications: A minimum of 1 year of specialized experience at least equivalent in difficulty and responsibility to the next lower grade/band level in the federal service is required. Specialized experience must have been in the field of fisheries and included ~~functions such as:~~ (a) observing ocean surroundings and vessel operations during harsh ocean conditions; (b) recording data on protected species observations and fishing operations; (c) recording sea turtle, seabird, and marine mammal encounters incidental to fishing operations; (d) collecting biological samples from postmortem specimens; and (e) entering data into a data base via computer.

Substitution of Education for Experience: Successful completion of a full 4-year course of study leading to a bachelor's degree with major study or 24 semester hours in any combination of scientific or technical subjects such as biology, chemistry, statistics, entomology, animal husbandry, botany, physics, agriculture or mathematics, of which at least 6 semester hours was directly related to fishery biology, may be substituted for the required experience.

Equivalent combinations of education and experience may also be used to meet the qualification requirements--only education in excess of the first 60 semester hours is creditable toward meeting the specialized experience requirement. Two full academic years of study (60 semester hours) beyond the second year is equivalent to one year of specialized experience.
Quality Ranking Factors (* = critical): (1) * Working knowledge of shipboard collection of biological, oceanographic, and management data; (2) * Ability to live and work in isolated situations under adverse conditions; (3) * Ability to interpret and follow written and verbal instructions for data collection protocols.

APPLICANTS MUST INDIVIDUALLY ADDRESS ALL OF THE ABOVE QUALITY RANKING FACTORS ON A SUPPLEMENTAL SHEET ATTACHED TO THEIR APPLICATIONS. FAILURE TO DO SO MAY RESULT IN NOT BEING REFERRED AMONG THE BEST QUALIFIED FOR THIS VACANCY

Application Address:
WASC/HRD, WC24, BIN C15700
7600 Sand Point Way N.E.
Seattle, WA 98115-0070
Attn: W/NMF/SWR/980000.LN

Internet Information Address:
http://www.rdc.noaa.gov
FAX: (206) 526-6673
TDD: (206) 526-6105

FOR RECORDED SELECTION RESULTS FOR THIS VACANCY AND OTHER EMPLOYMENT INFORMATION, CALL (206) 526-6294. THIS MESSAGE WILL BE UPDATED EVERY OTHER MONDAY AFTERNOON.

IF YOU WANT CONFIRMATION THAT YOUR APPLICATION HAS BEEN RECEIVED, SEND YOUR APPLICATION MATERIALS VIA CERTIFIED MAIL/RETURN RECEIPT REQUESTED OR OTHER FORM OF SELF-NOTIFICATION OF DELIVERY. PLEASE DO NOT CALL THE HUMAN RESOURCES OFFICE ON PHONE NUMBERS OTHER THAN THOSE LISTED ABOVE TO INQUIRE ABOUT THE STATUS OF YOUR APPLICATION.

Demonstration Project: Effective March 29, 1998, these positions converted to the DOC Personnel Management Demonstration Project. This project replaces the federal GS pay plan and structure. Under the project, positions are classified by career path, pay plan, and pay band. The following charts show how each of the 4 career paths correspond to the GS grades:

Career Path	PP	Pay Bands				
Scientific & Engineering	ZP	I	II	III	IV	V
Corresponding	GS	1-6	7-10	11-12	13-14	15
Sci & Engnr Technical	ZT	I	II	III	IV	V
Corresponding	GS	1-4	5-8	9-10	11-12	13
Administrative	ZA	I	II	III	IV	V
Corresponding	GS	1-6	7-10	11-12	13-14	15

General Support	ZS	I	II	III	IV	V
Corresponding	GS	1-2	3-4	5-6	7-8	9-10

Salary increases within pay bands occur through the pay-for-performance system only.

APPLICATION REQUIREMENTS

1. Provide the following information:
   a. The vacancy announcement number, position title, and grade level(s);
   b. Your full name, social security number, day and evening phone numbers, mailing address, country of citizenship, veterans preference, reinstatement eligibility, and highest federal civilian grade ever held on a permanent basis;
   c. The name, city and state of high schools attended and date of diploma or GED;
   d. The name, city and state of colleges/universities attended, majors, type and date of degrees **(IF QUALIFYING BASED ON EDUCATION, PROVIDE COPIES OF ALL COLLEGE TRANSCRIPTS; COMPLETED OPM 1170/17; OR LIST OF COURSES INCLUDING COURSE TITLES, GRADES, DATES COMPLETED, AND SEMESTER/QUARTER HOURS)**;
   e. The job titles, duties and accomplishments, salaries, employers' names and addresses, supervisors' names and phone numbers, starting and ending dates, and hours per week of any paid or non-paid work experience that relates to this vacancy;
   f. A statement as to whether or not we may contact your current supervisor; and
   g. Any job-related training courses, special skills, certificates and licenses, honors, or awards.
2. Use a resume, Optional Application for Federal Employment form (OF-612), Application for Federal Employment (SF-171), or any other written format, and send it to the Application Address.
3. Meet all eligibility and qualification requirements by the closing date.
4. Ensure that the application is postmarked by the closing date and received within the Human Resources office within three work days. Applications transmitted by facsimile machine are acceptable but must be received by the closing date. This agency bears no responsibility for ensuring that our machines are available for receipt of applications or for the quality of the copies. Note: Department of Commerce Career Transition Assistance Program eligibles may apply at any time until a certificate of eligibles is issued.
5. Apply at your own expense. Applications mailed in government postage-paid envelopes will not be accepted. Facsimiles from non-government machines are acceptable.
6. Current permanent (competitive status) applicants and those who have reinstatement eligibility must include a copy of their Notification of Personnel Action (SF-50) reflecting a "1" or "2" in block 24 and a "1" in block 34.

SPECIAL INTEREST INSTRUCTIONS

1. Career Transition Assistance Program (CTAP) and Interagency Career Transition Assistance Program (ICTAP) eligibles:
   a. CTAP eligibles must submit a copy of their specific RIF notice and documentation from their agency reflecting the promotion potential of their most recent federal position;